IDG.net N+I: Optimism despite steep drop in exhibitors. Page 5 QuickStudy: Blogs expand boundaries of public discourse. Page 30

COMPUTERWORLD

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APRIL 28, 2003 ▪ VOL. 37 ▪ NO. 17 ▪ $5/COPY

HP + Compaq, One Year Later

A Work in Progress

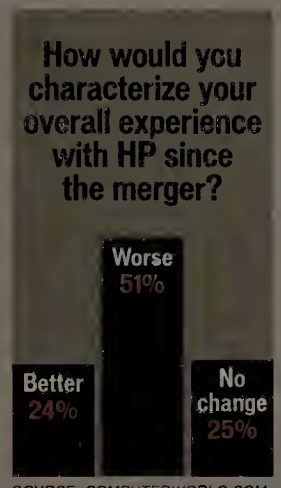
SPECIAL NEWS REPORT

Hewlett-Packard's acquisition of Compaq Computer one year ago next week has pleased some users and angered others. High-end system operators say the merger has yielded a welcome focus on critical systems. But users of midrange and low-end equipment say they're feeling ignored. Patrick Thibodeau reports on PAGE 6.

More Online

HP has bolstered its services business, but it's still no IBM.

QuickLink 38022
www.computerworld.com



SOURCE: COMPUTERWORLD.COM SURVEY OF 103 HP USERS

New Health Data Net May Help in Fight Against SARS

Consortium plans trial of national network that could alert officials to epidemics, bioattacks

BY BOB BREWIN

A consortium of public health agencies and health care companies in June plans to launch a three-month test of a data collection and distribution network that's designed to act as an automated early-warning system in the event of epidemics like the global spread of the SARS virus.

The Web-based network could also alert health care officials to possible bioterrorist attacks, said Janet Marchibroda, CEO of the eHealth Initiative Inc. consortium. Marchibroda confirmed the basic details of the trial run that's being planned by the Washington-based group, which has about 115 members, including major vendors of health care IT systems.

Some cities, including New York, developed local systems similar to the one envisioned by eHealth in the wake of the Sept. 11 terrorist attacks. But the U.S. lacks a cohesive and standards-based network that can be used nationwide, according to Marchibroda.

She said nine hospitals across the U.S. plan to take part in the test of eHealth's proposed National Healthcare Collaborative Network, along with local, state and federal health agencies that she declined to identify. Marchibroda also wouldn't name the IT vendors that will participate, or comment about the tech-

Health Net, page 59

The National Healthcare Collaborative Network pilot test will

- Use standards-based systems to mine emergency room data and transmit information to public health agencies.
- Support electronic data exchange standards mandated by the federal government.
- Help health officials watch for patient symptoms that could be signs of epidemics like SARS or bioterrorist attacks.

Bank's IT Workers Threaten Strike Over Outsourcing Deal

Union seeks role in Bank of Ireland's negotiations with HP

BY THOMAS HOFFMAN

Unionized members of the Bank of Ireland's IT department are threatening to go on strike if they aren't involved in final negotiations with Hewlett-Packard Co. on a proposed outsourcing deal.

Officials from Dublin-based Bank of Ireland and the union that represents its IT workers met last Tuesday for their first talks since the outsourcing plans were disclosed earlier this month. HP would take over management of the bank's networks and its desktop, midrange and mainframe systems as part of the deal, which is expected to be worth $600 million over seven years.

The planned agreement would also include the transfer to HP of about 500 workers from the bank's IT arm, where roughly one-third of the employees are members of the Irish Bank Officials' Association.

On April 16, two days after

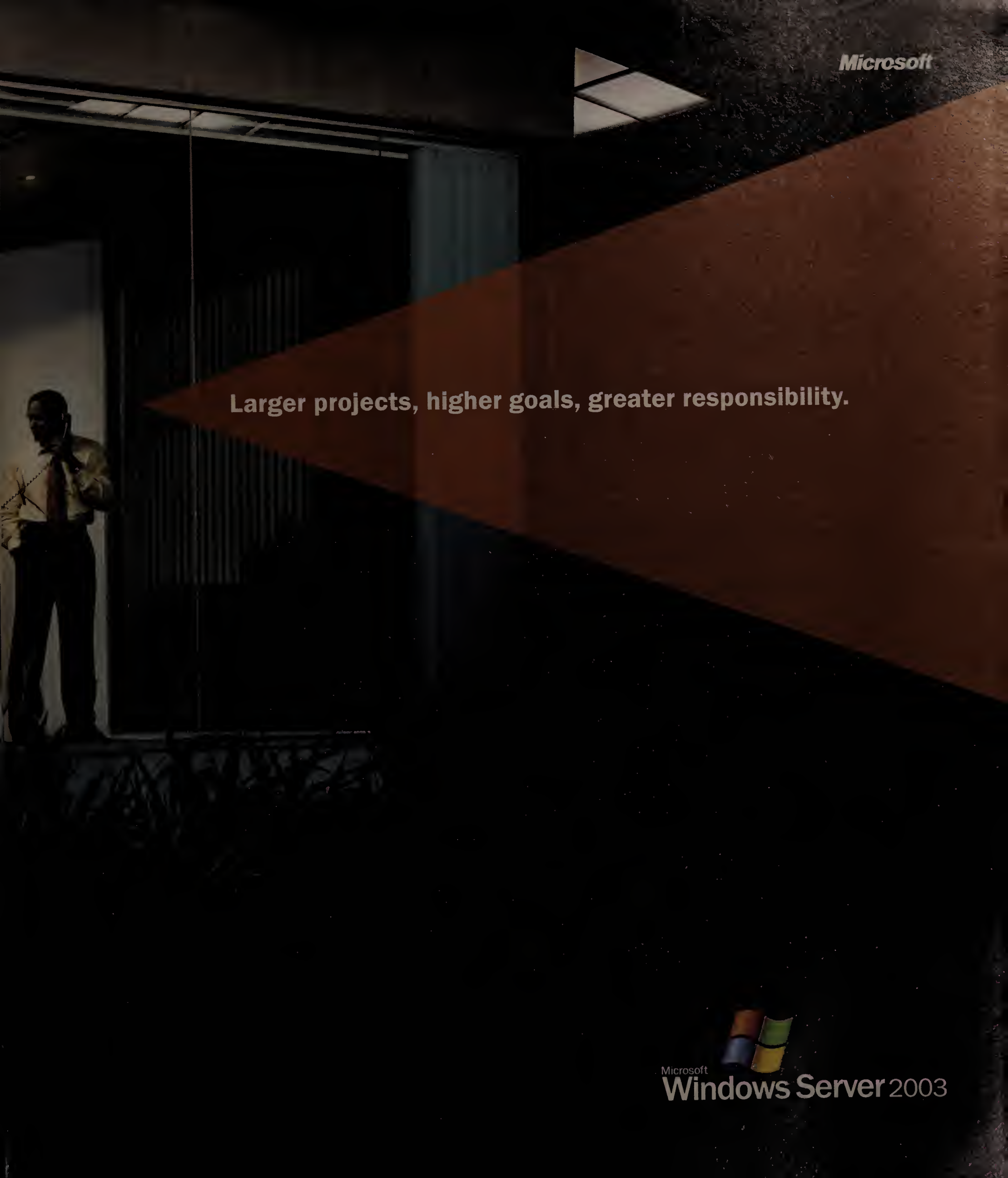
Strike Threat, page 59

Exporting IT JOBS

ISABELLE CARDINAL

IN AN UNRELENTING PUSH to lower costs, more companies are tapping cheaper offshore labor to handle routine IT tasks such as application maintenance, new software development and even infrastructure support. The net result: fewer and fewer IT jobs for U.S. workers, whose livelihoods are in serious jeopardy. PAGE 39

NEWSPAPER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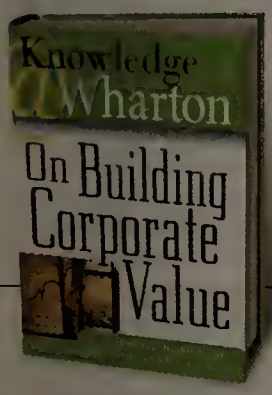

E-Business So Far

In the Management section: In their new book on e-business, two authors from the Wharton School analyze why some Internet ventures were profitable while others failed. **Page 46**

Windows Server 2003: Early Users Take the Plunge

In the Technology section: Some users couldn't wait for Microsoft's long-delayed Windows Server 2003. Four organizations say they've already realized benefits from migrating to the new operating system, but they also expended many months of effort to make sure they did. **Page 25**

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SPECIAL NEWS REPORT

On the first anniversary of the HP/Compaq merger, users weigh in on the company's performance. **PAGE 6**

4 **Intel promises** 64-bit Itanium chips that will boost 32-bit application performance.

4 **IBM is shipping** the upgraded WebSphere application server for z/OS and introducing a mainframe-style pricing model.

5 **Networld+Interop opens** this week, amid optimism that's surprising, given that there will be half as many exhibitors as there were last year.

5 **Microsoft pits** SQL Server 2000 Enterprise Edition against Unix-based systems.

8 **The Homeland Security** Department's leadership change raises questions about its effectiveness in the area of cybersecurity.

10 **Regulations like HIPAA** create a dangerous gap between legal requirements and the technical means of compliance.

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50 **Follow-up: Tyson Integrates IT, Cuts Costs After Merger.** Tyson Foods has finished one phase of its massive IT project after acquiring IBP.

OPINION

20 **Patricia Keefe** discusses the current sea change in the IT industry and suggests issues to focus on while gearing up for the next evolution of IT.

20 **Pimm Fox** says that Web services will finally give IT some security and provisioning capabilities, now that the Service Provisioning Markup Language has arrived. And it's about time.

21 **Thornton May** urges IT leaders to push ahead with projects that solve companies' desperate need for real-time demand- and portfolio-management technologies.

34 **Robert L. Mitchell** predicts that technology convergence is likely to force IT staffers into unexpected new roles.

48 **Peer to Peers: Donald Finley** writes that IT professionals are watching job opportunities fade away, as companies like Microsoft and GE set up IT shops overseas and the economy remains slow.

60 **Frankly Speaking: Frank Hayes** gives a refresher course in how to screw up and even offers a cheat sheet of 13 ideas — in case you've forgotten how.

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Control Your Company's Mobile Devices

How do you get and keep control of the plethora of mobile devices pervading your company? Joan Herbig, CEO of XcelleNet, has a few ideas. QuickLink 37959

What Do You Think About the Future of IT?

Read Patricia Keefe's editorial on page 20, and then head to our online forum to share your opinions and read what others have to say. QuickLink a3070

An Introduction to Arrays

DEVELOPMENT: Get an overview on how to use arrays in PHP. QuickLink 37936

Hands On: Apple Remote Desktop

MAC: A new version of Apple Remote Desktop is out, and Hunter College's Yuval Kossovsky offers a hands-on view of what the application has to offer enterprise users. QuickLink a3080

What's BGP Got to Do With Internet security?

SECURITY: Columnist Marcia J. Wilson takes a close look at the risks of the Border Gateway Protocol and what can be done to secure this critical Internet protocol. QuickLink 37750

Weblogs

See editors' picks of interesting content from around the Web. QuickLink a3090

What's a QuickLink?

On some pages in this issue, you'll see a QuickLink code pointing to additional, related content on our Web site. Just enter that code into our QuickLink box, which you'll see at the top of each page on our site.

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QuickLink a2420

AT DEADLINE

Microsoft Extends Office 2003 Beta

Microsoft Corp. said that after getting feedback from early users, it plans to release a "refresh" of the beta-test version of its Office 2003 software before starting commercial shipments. That will delay the scheduled launch of the desktop applications upgrade from June to sometime in the third quarter. A Microsoft official said the company is addressing "some minor issues that can impact customer satisfaction."

Security Hole Found To Affect NT 4.0

Microsoft also said that systems running Windows NT 4.0 are vulnerable to a software flaw used to attack Windows 2000 servers in March. When it first warned of the problem, Microsoft said only Windows 2000 was affected [QuickLink 37224]. But the flaw is in a core component in both operating systems, it said last week.

Cisco Warns of Flaw in Software

Cisco Systems Inc. warned of a buffer overrun flaw in the Windows version of its Secure Access Control Server software, which manages access to the company's routers, switches and other devices. The vulnerability could be used to launch denial-of-service attacks or gain system administrator access to devices, Cisco said. Patches are available on Cisco's Web site.

Lucent CEO Will Manage Operations

Lucent Technologies Inc. in Murray Hill, N.J., announced that Chairman and CEO Patricia Russo will take over day-to-day management duties from Bob Holder, who will step down as chief operating officer this summer. Russo said she "decided that it was the right time to consolidate our top management structure."

Intel Moves to Boost Itanium's 32-bit Power

Develops new software to work with the next version of its 64-bit processor

BY TODD R. WEISS

INTEL CORP. last week said the next version of its 64-bit Itanium 2 chip will come with new software designed to improve the performance of 32-bit applications running on Itanium 2 systems.

The new chip, code-named Madison, is scheduled to ship in the second half of the year, said Intel spokesman Scott McLaughlin. He added that the IA-32 software execution layer will give 32-bit applications running on Itanium 2-based servers performance on par with that of systems built around the 1.5-GHz version of Intel's Xeon MP processor. Pieces of the software will be installed on the chip itself and as part of operating systems.

The disclosure of Intel's software plans coincided with chip rival Advanced Micro Devices Inc.'s announcement of its 64-bit Opteron server processor, which also was designed to run 32-bit applications at speeds comparable to their performance on existing systems [QuickLink 37872].

McLaughlin said the IA-32 technology is part of a "natural evolution of 32-bit support on Itanium." The software execution layer has been under development for several years and is currently undergoing validation testing, he said.

But McLaughlin acknowledged that Intel has heard complaints about 32-bit application performance on Itanium-based systems.

Although Intel officials acknowledge that the Itanium processors already include built-in support for running 32-bit applications, real-world performance levels have been less than awe-inspiring, said Rich Partridge, an analyst at D.H. Brown Associates Inc. in Port Chester, N.Y.

By announcing the software plans, Intel is moving "to address what is perceived to be a problem," Partridge said. "The perception is that the current hardware [support] for 32-bit applications on Itanium 2 doesn't give full performance."

That has opened up a potential marketing opportunity for Sunnyvale, Calif.-based AMD. IBM last week said it plans to ship Opteron-based systems later this year, and AMD's new chip also drew promises of operating system support from Microsoft Corp., Red Hat Inc. and SuSE Linux AG.

Charles King, an analyst at The Sageza Group Inc. in Mountain View, Calif., said he thinks Intel will be seen as trying to play catch-up with AMD on 32-bit application support in the wake of the Opteron launch. "That probably woke them up a little bit," King said.

Most users have been telling Intel officials that they plan to move to 64-bit applications when they install Itanium-based systems, McLaughlin said. But a major reason for incorporating the new software layer is to let companies continue to use 32-bit applications that haven't yet been ported to 64-bit systems, he added. ◗

Intel's 32-bit Upgrade Plan for Itanium 2

- New execution software designed to speed up 32-bit applications will be offered with the next version of the processor, which is **due later this year.**
- The software will **provide performance equivalent** to what users can get on existing systems equipped with Intel's 1.5-GHz Xeon MP chips.

IBM to Ship WebSphere 5.0 For z/OS, Alter License Plan

Pricing will switch to mainframe's value-unit model

BY CAROL SLIWA

IBM this week will ship a new version of its WebSphere application server for the z/OS operating system and introduce a new pricing model for the product.

The prior version of WebSphere for z/OS had been priced at a fixed $35,000 per processor. The new edition will adopt the value-unit pricing model that's familiar to IBM's mainframe customers, said David Chew, director of WebSphere enterprise transaction systems.

"We changed for the zSeries because these processors tend to be rather big and powerful, and customers are used to a pricing model that is more akin with their hardware structure," Chew said.

Value units are calculated based on the processing performance of the zSeries hardware. The capacity of the mainframe is measured in millions of service units.

Customers purchase licenses based on the number of processors they actually use, but those with older zSeries models pay less per processor, since their machines perform at lower levels than the newer models. WebSphere has a tool that's designed to help customers determine how many value units they need based on their hardware.

Marcy Nechemias, IBM's marketing manager of WebSphere for z/OS, said existing users of WebSphere for z/OS will see no change in cost. Their inventory will simply show the correct number of value units instead of "engines," or processors.

"It's just a conversion from one metric to another," said Nechemias.

New customers who buy WebSphere for z/OS for fewer than three engines and notice that the old per-processor pricing model might have worked out to be cheaper will find an entry-level option to get started at a lower cost, according to Nechemias.

"We want to see WebSphere become a pervasive product on the mainframe platform," Nechemias said. She added that IBM is trying to ensure that customers will see a lower cost for incremental growth once they start using WebSphere for z/OS.

The entry-level option applies to customers buying 20 value units on the z900 or 10 v[illegible] on the z800. Pricing starts at [illegible] and declines with volume purchases.

Java Support

WebSphere 5.0 is certified for Java 2 Enterprise Edition (J2EE) 1.3 technologies and also supports more than half the J2EE 1.4 technologies that are due to be finalized later this year, according to IBM. The version for z/OS is designed to take advantage of many zSeries capabilities, including its high reliability, scalability and security.

Stephen O'Grady, an analyst at RedMonk in Hollis, N.H., said that IBM has worked hard to reduce the differences between versions of WebSphere and that the job of porting applications from smaller boxes to the mainframe should be easier with WebSphere 5.0. ◗

Networld+Interop Optimism Prevails Despite Downturn

Vendor count half that of last year's show

BY MATT HAMBLEN

NetWorld+Interop opens this week in Las Vegas amid an optimism that belies the depressed state of the economy, ongoing travel concerns and the fact that there are fewer than half as many exhibitors this year as there were at last spring's event.

The mood is especially upbeat compared with last fall's N+I in Atlanta. Organizer Key3Media Events Inc. boarded up that show for good after key vendors failed to participate. Two networking shows per year was one too many, said Mike Millikin, senior vice president of Los Angeles-based Key3Media.

Users said they hope to gain some insights into new technologies this week so they will be ready to go when the economy improves.

"I feel pretty optimistic about the future of technology, and in two years, you'll see some extraordinary things, especially with wireless," said Michael Krone, network manager at The United Center, a sports and entertainment venue in Chicago.

Krone said he plans to research voice-over-IP and wireless products, "right there with the vendors in front of my face." As a major user of products from Foundry Networks Inc. in San Jose, Krone said he wants to compare Foundry's technology with that of Extreme Networks Inc. in Santa Clara, Calif., among others, to see which products offer the most affordable and effective path to IP convergence.

Rick Sloan, telecommunications manager at Dollar Tree Stores Inc., a chain of 2,300 retail outlets based in Chesapeake, Va., said he plans to hit seminars and the show floor to expand his knowledge beyond pure telecommunications technologies. Sloan said Dollar Tree is a satisfied user of gear from Avaya Inc. in Basking Ridge, N.J., and Cisco Systems Inc. But he said he doesn't want to become "complacent" with his vendors. Dollar Tree's culture is "pretty mean and lean," with an emphasis on cost savings, he said. "We sell everything for a dollar, so there's not a lot of fluff" in the company's IT infrastructure, Sloan said.

AT THE SHOW

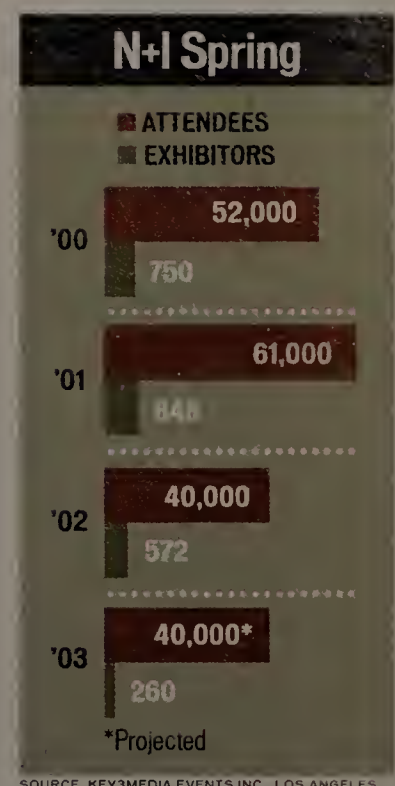
Go online for highlights of key announcements planned for this week's N+I:

QuickLink 38014
www.computerworld.com

This week's show is on track to draw 40,000 people, matching the attendance at last year's N+I show in Las Vegas, Millikin said. But there will be only 260 vendors on the show floor, down from 572 in 2002, show officials said.

MCI, formerly WorldCom, may have the most ambitious agenda among the vendors, as it tries to demonstrate a resurgence following its Chapter II bankruptcy filing. N+I is "timed perfectly" with MCI's completion of its 100-day reorganization plan and rebranding effort, said Ron McMurtrie, MCI's vice president of global branding. MCI will unveil a road map for building IP and convergence services with the announcement of a secure internetworking gateway, said McMurtrie.

Officials of several large networking vendors said N+I is still the most important show they attend each year in North America. "N+I is extremely important for us . . . and we have been more selective with going to shows recently," said Duncan Potter, vice president of marketing at Extreme Networks. The company is providing what Potter called the "world's largest temporary LAN" to serve as the show's networking infrastructure.



SOURCE KEY3MEDIA EVENTS INC., LOS ANGELES

Corrections

In our April 21 story "Tight IT Budgets Put Crimp in SAN Plans," information about IT layoffs at Telus Communications Inc. and about the size of the company's data storage relative to networked storage was incorrectly attributed. The information should have been attributed to David Chamberlain, vice president of architecture at Providian Financial Corp.

In our April 21 story "The Best of Both Shores," the name of Allstate Insurance Corp.'s assistant vice president for finance was misspelled. The correct spelling is Mike Scardina.

Our April 21 feature "802.11g Speeds Ahead of Needs," contains a typographical error. In the sentence "To support both 11a and 11g client types, corporations must buy more expensive, dual-mode access points," 11g should read 11b.

Microsoft Releases 64-bit SQL Database

Enterprise Edition touted as Unix alternative

BY MARC L. SONGINI

Microsoft Corp. has released a 64-bit database and claims that the new system features performance rivaling that of Unix-based systems yet offers greater ease of use at a lower cost.

In conjunction with the launch of Windows Server 2003, Microsoft last week announced that it's shipping the 64-bit SQL Server 2000 Enterprise Edition. With the move, Microsoft follows in the footsteps of Oracle Corp. and IBM, which have offered 64-bit versions of their databases for Unix and mainframe systems for years.

Oracle, meanwhile, announced the availability of a version of Oracle9i Database Release 2 that's optimized for 64-bit Windows Server 2003.

Microsoft's 64-bit version of its SQL Server database gives high-end database users an alternative to Unix, said Sheryl Tullis, Microsoft's product manager for SQL Server. "For customers that need high-powered computing, this makes it attainable without the upfront maintenance and management costs of Unix systems," she said.

Tests indicate that the database will have 512GB of addressable memory, double what was available under 32-bit SQL Server.

> **"It's the same as ever with 64-bit. It's a technology in search of a mass-market application."**
>
> JAMES GOVERNOR, ANALYST, REDMONK

Forest Hills, N.Y.-based airline JetBlue Airways Corp. in December went live with a 64-bit SQL Server database that supports the company's frequent-flier application, said CIO Jeff Cohen. JetBlue is building a 64-bit SQL Server-based data warehouse to run customer analytics, Cohen said.

The airline is currently running 32-bit SQL Server to support internal business applications and an Oracle database for special aviation applications. Cohen said that when using the 32-bit SQL Server for the frequent-flier application, JetBlue had to keep adding more servers and processors to maintain performance. With a 64-bit architecture, the company was able to shrink a three-server Compaq ProLiant system with 12 processors to one four-way Hewlett-Packard Co. server.

"We were very thrilled by performance," said Cohen, who added that 64-bit SQL requires only 10% to 20% CPU utilization, as opposed to as much as 60% with 32-bit SQL.

But aside from the very few organizations that have a need for "serious number crunching," there will be a limited demand for 64-bit SQL Server, said James Governor, an analyst at RedMonk, a consulting firm in Hollis, N.H. "It's the same as ever with 64-bit. It's a technology in search of a mass-market application. Sixty-four bit is a 'nice to have,' not a 'need to have' in many cases."

According to Tullis, Microsoft has commitments from business software vendors Siebel Systems Inc., PeopleSoft Inc. and SAP AG to optimize their software for the 64-bit version of SQL Server.

MORE THIS ISSUE

Microsoft's Bill Veghte discusses the competition faced by Windows Server 2003. Page 16

Postmerger HP's Rating Differs by Size of User

One year later, HP's union with Compaq draws raves, criticism

BY PATRICK THIBODEAU

One year after Hewlett-Packard Co.'s acquisition of Compaq Computer Corp., user opinion about the impact and benefits of the merger is decidedly mixed.

High-end users, such as Steven Barker, systems administrator for the automated teller machine system at Huntington National Bank in Columbus, Ohio, said he has seen a big improvement in support for the NonStop fault-tolerant computer line, which Compaq acquired in 1997 when it bought Tandem Computers Inc.

Before the merger, Compaq would send representatives "who couldn't even spell Tandem," he said. "Now it seems like they concentrate on us a little bit more."

But at Valley Presbyterian Hospital in Van Nuys, Calif., it's a much different story. HP "made a lot of changes without talking to customers, and they used to be really good about talking to their customers," said senior programmer analyst Catherine Litten, who's in charge of the hospital's HP 3000 minicomputer, which is being phased out.

The merger meant the end of HP's Vectra desktop line, on which the hospital had standardized. That move, on top of a premerger decision to end HP 3000 support in 2006, has Litten roiled. "How many things are we going to have to replace here?" she said, noting that it will cost the hospital about $1 million to replace the HP 3000.

Strategy Still Sketchy

HP's enterprise strategy is a work in progress. Immediately following the merger, the company released road maps for key products. But questions persist, and the company doesn't seem to be doing a uniform job in reaching users.

Users with clout are getting answers. For example, Andi Coleman, the Tandem security team leader at Charlotte, N.C.-based Bank of America Corp., said HP is paying attention to her because of the size of her company and her role as moderator of the special interest group on security for the ITUG HP NonStop user group.

NonStop users have gotten HP to agree to security improvements, said Coleman, and she's optimistic that HP will give more attention to the line. "I think that Compaq kind of left it sitting over there in the corner," she said.

Although Coleman has met with top HP officials, no one has come knocking on Robert Rothenberger's door. Rothenberger, director of data center operations at Keystone Mercy Health Plan in Philadelphia and chairman of a regional group of the AFCOM data center association, said he has yet to hear from HP following the merger. "I would have thought that they'd have made an effort to pull together something and come to their good customers," he said. HP is planning to detail its enterprise strategy on May 6, and Rothenberger said he hopes it shows "a commitment to a unified strategy, where I can be convinced that service and support will be dedicated to that strategy."

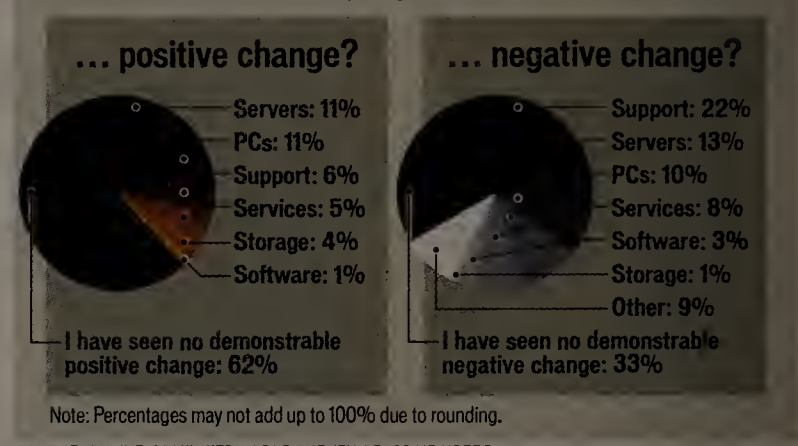
HP is continuing to support the OpenVMS operating system, which Compaq acquired through its purchase of Digital Equipment Corp. in 1998. Some users had been concerned about HP's support plan for OpenVMS running on VAX and Alpha processor systems, since the company is moving all of its high-end servers, including NonStop, to Intel Corp.'s 64-bit Itanium chips. But HP appears to have ameliorated those concerns.

Arthur McClinton, a principal scientist at Mitretek Systems Inc., a Falls Church, Va., company that runs U.S. weather satellites, said HP recommitted to Compaq's support road map for VAX and Alpha and will continue to maintain the system until 2012. That's "what I was after," he said.

But while OpenVMS will survive, the merger is spelling the end of Compaq's Tru64 Unix running on Alpha. HP is planning two more releases of Tru64, one later this year and one next year, and will continue support until 2011. Customers will get a "very long runway" to consider migration options, said Don Jenkins, HP's director of operating environments.

HP is also integrating key aspects of Tru64 in its HP-UX Unix operating system, such as its TruCluster Server and Advanced File System. But the decision is risky for HP because it will be as easy for Tru64 customers to move to other vendors' systems as it will be to move to HP-UX, said Paul McGuckin, an analyst at Gartner Inc. in Stamford, Conn.

The merger has affected users in other ways as well. The uncertainty, along with HP's announcements of layoffs, prompted Dan Barth, CIO at The Oklahoma Publishing Co. in Oklahoma City, to begin purchasing servers from Dell Computer Corp. after buying Compaq systems for years. "We didn't want to go through the change of the merger and find out what product lines were going to survive," he said. Barth isn't ruling out going with HP in the future. But "until we know better, let's caution ourselves," he said.



Note: Percentages may not add up to 100% due to rounding.

SOURCE: ONLINE *COMPUTERWORLD* SURVEY OF 103 HP USERS

HP Plots Itanium Course

Part of HP's postmerger strategy includes moving all of its high-end systems to Intel's Itanium chip. It will be a lengthy process.

Only 3,000 Itanium servers were shipped worldwide in the fourth quarter last year, according to IDC in Framingham, Mass. That's out of roughly 1 million servers shipped during the period.

But HP's product strategy is gaining steam. Last week, the company announced benchmarks by the Transaction Performance Processing Council (TPPC), an independent, nonprofit testing group in San Jose, for its planned Superdome server. The server will run the upgraded Itanium 2 processor, code-named Madison, with a 64-bit version of Windows Terminal Server.

Rich Partridge, an analyst at D.H. Brown Associates Inc. in Port Chester, N.Y., said new products typically ship within six months of the benchmark release to comply with TPPC rules.

HP this month also announced a sale of 1,000 Itanium 2 chips to BP PLC to build a clustered system running Linux in BP's seismic research facility in Houston.

Technical computing operations are typical early adopters of new chips. Keith Gray, manager of BP's high-performance computing center, said the company is in a "risk-based business," and it believes having better seismic imaging can help control costs while improving its ability to find and extract oil.

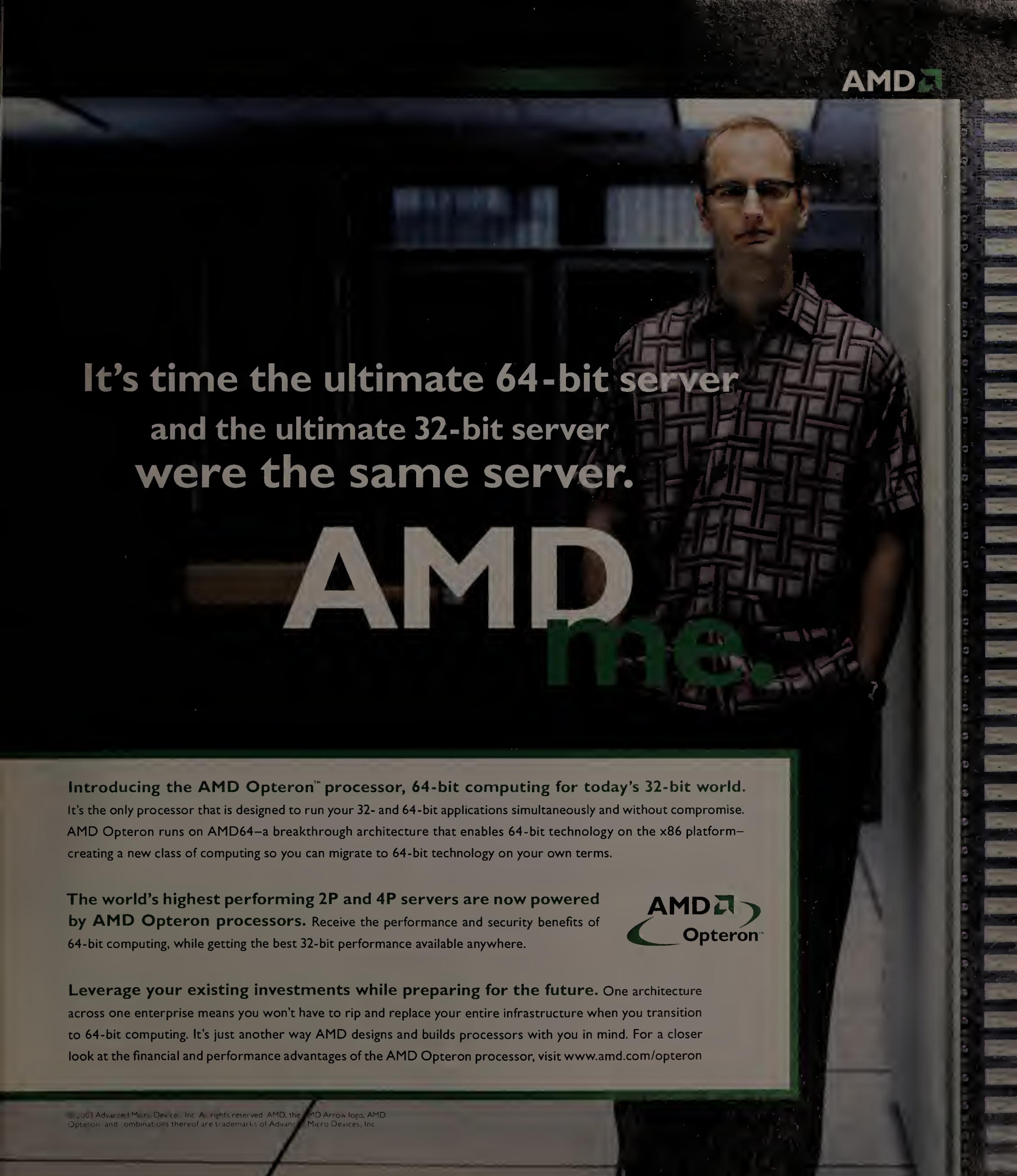
Mark Melenovsky, an IDC analyst, said Itanium chip sales in technical and other niche markets could spur interest in commercial application development for the new chip. "That's how a new platform or new operating system gets started," he said.

But not all early Itanium adopters are technical users. Fortis Inc., a Milwaukee-based insurance provider, has begun using a version of Unisys Corp.'s ES7000, a 32-way server that can integrate 64-bit Itaniums and the 32-bit Xeon.

Roger Jones, senior vice president and CIO at Fortis, said he went with the scalable system rather than a clustered approach because he believed the cost would be lower. "The more machines you have, the more you have to maintain," he said. He's using the system for memory-intensive services, such as file and print, and for terminal services.

Jones said the industry is in a chicken-or-egg situation with Itanium, where software vendors are reluctant to write code for the 64-bit systems without a demand for it, and users aren't demanding the systems because there are no applications. But Jones maintains that the core systems are in place and that 64-bit processing is inevitable.

– Patrick Thibodeau



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BRIEFS

Pentagon Chooses EDS for IT Revamp

Electronic Data Systems Corp. said it has won a contract, valued at $258 million over two years, to upgrade the Pentagon's IT infrastructure in an effort to ensure the technology can withstand a Sept. 11-like terrorist attack. The contract covers networks, voice and data messaging systems, and data storage devices at the Department of Defense, said Plano, Texas-based EDS.

Microsoft Patches Browser Holes . . .

Microsoft Corp. issued a software patch designed to plug four security holes in its Internet Explorer Web browser. The company gave three of the flaws a "critical" severity rating and said the most serious could be used to run malicious code on systems. Microsoft also released a patch to fix a vulnerability in its Outlook Express e-mail software.

. . . And Says It's Revising Fix for XP

In another security-related matter, Microsoft said it's revising a patch issued April 16 to address a buffer overrun flaw in the Windows kernel, after users complained that the fix can cause performance slowdowns on some PCs running Windows XP. But Microsoft left the original patch on its Web site and said it could still be used. Other versions of Windows aren't affected.

Short Takes

LUCENT TECHNOLOGIES INC. in Murray Hill, N.J., reported a $553 million loss for its second quarter, which ended March 31. But Lucent said it still expects to become profitable from an operating standpoint during its current fiscal year . . . EDGAR F. "TED" CODD, who in the late 1960s invented the relational model of storing data, died April 18 at the age of 79.

Public/Private Security Partnership Gets Rocky

Companies want guidance on where responsibility lies

BY DAN VERTON
WASHINGTON

THE CHANGING of the cybersecurity guard at the Department of Homeland Security (DHS), coupled with complacency on the part of some corporate executives, has put a higher premium on information-sharing and cooperation between the private sector and the government.

"The two words to focus on are *cooperation* and *coordination*," said Richard Davidson, CEO of Omaha-based Union Pacific Corp., which combats more than 80,000 probes on its networks daily. "That all adds up to partnership and information-sharing, and that is our best form of protection during these challenging times," said Davidson, who also serves as chairman of the President's National Infrastructure Advisory Commission.

Davidson spoke last week at a U.S. Chamber of Commerce conference in Washington that addressed the roles and responsibilities of the government and private sector in homeland security efforts.

Security Slowdown

Uncertainty stemming from the loss in recent months of critical cybersecurity leadership at the DHS could escalate into danger for private-sector companies, said Michael Hershman, president and CEO of Decision Strategies LLC, an Oakton, Va.-based security consulting firm.

Companies have started to slow down their efforts to boost security because there has been no terrorist activity recently, Hershman said.

> **"Corporations in America have spent billions of dollars for security, with very little cost-benefit analysis."**
>
> **MICHAEL HERSHMAN,** PRESIDENT AND CEO, DECISION STRATEGIES LLC

"I'm afraid that they may be drawing back into complacency," he said. "In recent months, we've seen corporations stand back, reassess what their needs are and try to understand what the level of threat is."

But a lack of effective communication between the corporate community and government agencies has left companies trying to assess their risk with little or no understanding of the threat, Hershman said.

"Corporations in America have spent billions of dollars for security, with very little cost-benefit analysis," said Hershman. He noted that the Bush administration has only added to the confusion regarding who is ultimately responsible for critical infrastructure security by assigning responsibility to industry while issuing more than 60 regulations since Sept. 11, 2001.

The lack of order and stability in the way the government currently deals with the private sector — a situation exacerbated by the recent creation of the DHS — is of immediate concern to Michehl Gent, president of the North American Electric Reliability Council in Princeton, N.J.

"We have a constant fight among agencies for the hearts and minds of industries," said Gent, referring to the multitude of federal agencies that regularly bombard private-sector entities with requests for security information. "DHS is supposed to do that, and I'm looking forward to them being more successful. But in the meantime, I have to keep warding off [government agencies]." ◗

Schmidt's Departure From DHS Raises Cybersecurity Leadership Concerns

WASHINGTON

The private-sector IT security community will lose a staunch advocate in the White House on May 1 when Howard Schmidt leaves government service.

Schmidt, heir apparent to the role of chief cybersecurity adviser to the secretary of homeland security, announced last week that he plans to retire after only 17 months as vice chairman of the President's Critical Infrastructure Protection Board. Schmidt served alongside Richard Clarke, the nation's first chief cybersecurity adviser, who retired in February.

Matters of cybersecurity now fall to Robert Liscouski, a former executive at The Coca-Cola Co. who was recently named assistant secretary of infrastructure protection at the DHS. His responsibilities include cybersecurity and protecting the nation's vital physical assets from attack.

The concern is that without a single individual responsible for private-sector cybersecurity, it could get lost in layers of DHS bureaucracy.

Alan Paller, director of the SANS Institute, a security research firm in Bethesda, Md., said he was saddened by Schmidt's decision to leave. "He was the one representative from industry that actually understood the way attacks are launched and what needed to be done to stop the attacks," Paller said.

David Wray, a DHS spokesman, said the department couldn't comment on what the White House may or may not do about having a single individual in the DHS who is responsible for cybersecurity. But he noted that many of the technology industry's leading companies have recognized the importance of and adopted an integrated approach to cyber and physical infrastructure security.

SCHMIDT says he's leaving behind a clear road map for a coordinated effort.

Schmidt downplayed the impact that his retirement will have on the government's ability to work with the private sector.

"We have to understand that this [issue] is more than just a person," Schmidt said. "Irrespective of where it is in the administration and where it is executed now, we have a clear road map and people who are empowered to make [the strategy] work."

Still, Harris Miller, president of the Arlington, Va.-based Information Technology Association of America, said not appointing a prominent individual to a position that is solely responsible for cybersecurity is unfortunate. "Not having someone like Howard or Dick Clarke as a special adviser to the secretary is a big error, in my estimation," said Miller.

"We're experiencing the loss of two real experts that [private] industry and the country depended on," said Larry Wortzel, an analyst at conservative think tank The Heritage Foundation and a career military intelligence officer. "I hear dissatisfaction with the model" of making one individual responsible for both cybersecurity and physical infrastructure protection, he said.

– Dan Verton

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Delta Technology CEO

Data Security Measures Failing To Match Legal Expectations

Regulations raise stakes for compliance

BY JAIKUMAR VIJAYAN

EMERGING LEGAL expectations for data security and privacy are making it increasingly important for companies to demonstrate reasonable care in protecting their IT assets, say security and legal experts.

Regulations such as the Health Insurance Portability and Accountability Act (HIPAA), the Gramm-Leach-Bliley Act and the Sarbanes-Oxley Act (see story below), as well as several proposed state and federal identity-theft prevention laws, impose significant security and administrative requirements on companies. The problem is that there are no regulation-specific technology standards or guidelines that companies can adopt to demonstrate compliance with these requirements.

The regulations have considerably increased the legal exposure of companies in the event of security breaches, said Erin Kenneally, a forensic analyst and attorney at the San Diego Supercomputer Center in La Jolla, Calif. "From a legal-risk standpoint, it is a very unstable field," Kenneally said.

Reasonable Attempts

Companies must establish processes to show that reasonable attempts are being made to secure data, said Bruce Heiman, a partner at Preston Gates Ellis & Rouvelas Meeds LLP in Washington. "You need to say what you'll do and do what you say," he said.

Because most of the laws are technology-agnostic, there is a "considerable level of interpretation" regarding how they should be implemented technologywise, said Lew Wagner, chief information security officer at the M.D. Anderson Cancer Center at the University of Texas in Houston. "At one level, they all boil down to access-control systems, audit-control systems, some sort of encryption capability for confidentiality and other administrative stuff, such as policy and training."

But because the legal view of due-care standards may differ from a technologist's view, in many cases, the courts will have to decide what acceptable standards are, said Jon Stanley, an attorney on the American Bar Association information security committee.

"Something will become a standard because a court says it is a standard. And ultimately, litigation specialists will go into IT rooms and say, 'Here is what you are going to have to do' " to comply, Stanley said.

Don't be surprised to see many companies biding their time, waiting for such case law to emerge before implementing widespread security-related technology changes, said Roger Brown, an IT auditor at Jefferson Health System, a $2 billion health care organization in Radnor, Pa.

Though HIPAA's privacy compliance and code-transaction testing deadlines went into effect April 14, health care organizations don't have to implement related security changes until 2005. But organizations that haven't implemented those changes are unlikely to be fully compliant with the privacy requirements currently in effect, he said.

"HIPAA should change the price of ignoring technology-related risks" for health care organizations, Brown said. But because it's written vaguely from an implementation standpoint, he said, the "final details will be fleshed out in the trial courts."

The best way to mitigate legal exposure is to be proactive about putting in place measurable and auditable security processes, Kenneally said.

For instance, any organization should be able to show who has access to its systems, what measures control and monitor that access, what accountability exists for actions within the systems, and how systems violations or unauthorized access is detected and responded to, Wagner said.

It's also vital to have a good security-audit logging process to ensure that evidence of all transactions is stored in a manner that meets legal requirements for reliability, Kenneally said. This might require processes for automatically transmitting logs from the generating host to a centralized logging system to prevent tampering, Kenneally said. ▶

Security Yardstick

Standards for evaluating general security readiness include:

- Generally Accepted Information System Security Principles from the Information Systems Security Association.
- ISO 13335 guidelines for management of IT security from the International Standards Organization.
- Federal Information System Controls Audit Manual from the General Accounting Office.

CFOs Push IT Managers for More Info About Projects

Sarbanes-Oxley boosts reporting demands for CIOs

BY THOMAS HOFFMAN

The financial reporting regulations that were signed into law last year are spurring some chief financial officers to demand that CIOs provide them with more detailed information about the status of IT projects, according to executives and analysts.

The Sarbanes-Oxley Act, which is aimed at producing more complete and accurate assessments of the financial condition of public companies, requires businesses to disclose "all material off-balance-sheet transactions" that may affect their capital expenditures or other aspects of their finances.

Because IT spending accounts for more than half of all capital expenses at many companies, CFOs are pushing hard to ensure that they can update quarterly earnings reports with as much information as possible about ongoing IT projects, said business and technology executives.

"Without question, CFOs are going to place more pressure on everyone in the organization because of Sarbanes-Oxley," said Paul McFeeters, CFO at Kintana Inc., a Sunnyvale, Calif.-based vendor of software for monitoring IT operations and automating tasks like project management.

Companies "can't run off with multimillion-dollar IT projects without good visibility and controls," added McFeeters, who uses Kintana's digital dashboard software to keep track of internal IT projects. He said senior executives are also requesting more thorough financial reports from corporate officers to satisfy a provision of Sarbanes-Oxley that requires CEOs and CFOs to attest to the accuracy of a company's financial data.

Steve McDowell, CIO at privately held Holiday Retirement Corp., a Salem, Ore.-based operator of senior citizen housing, said he's talked with IT executives from public companies about Sarbanes-Oxley and they "are really afraid that it will dominate their projects and budgets for a while."

The push for CIOs to deliver more comprehensive information about IT spending "is very much a trend that we're seeing," said Jeremy Grigg, a Gartner Inc. analyst based in New York. But like McFeeters and others, Grigg noted that the reporting demands being placed on CIOs aren't tied solely to Sarbanes-Oxley.

Indeed, a growing number of companies are taking a portfolio management approach to evaluating the returns being generated by their IT investments [QuickLink 36205]. Steve Denny, CIO at Plano, Texas-based FreightPro, has delivered a formal report on the status of IT projects to the logistics provider's board of directors each quarter for the past three and a half years. The reports detail the anticipated cost, timeline and benefits of both new and existing projects, he said, adding that IT work typically accounts for the bulk of FreightPro's capital expenditures. ▶

Financial Reporting Recommendations For CIOs

- Educate your company's CFO on the technical and financial requirements needed to deliver status reports about IT projects.
- Account for spending on internal IT projects and joint ventures that may require your systems to be linked to those at other companies.
- Reach out to peers in Europe and other regions to see how they're complying with financial reporting rules that are already in place there.

Editor's Note

Mark Hall is on vacation. His column, On the Mark, will return next week.

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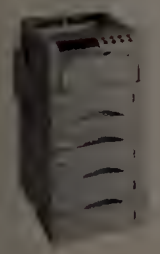

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BRIEFS

John Hancock to Outsource to IBM

John Hancock Financial Services Inc. said it plans to outsource key IT operations, such as management of its servers, mainframes and networks, to IBM. The companies expect to finalize the deal by midyear. Boston-based John Hancock said that about 100 of the 300 affected IT workers will lose their jobs. Another 180 employees will be shifted to IBM, and John Hancock will retain 20 people to oversee the outsourcing work.

Boat Maker Picks IBM to Operate Net

IBM also announced a deal to host and manage a Web-based supply chain network for General Dynamics Corp.'s shipbuilding division. The Electric Boat Corp. unit in Groton, Conn., hopes to link 150 suppliers to the network by year's end, IBM said. The network is built around IBM's Intel-based servers and its WebSphere and DB2 software. Financial terms weren't released.

Siebel, PeopleSoft To Cut Workforces

Siebel Systems Inc. and PeopleSoft Inc. both said they plan to cut jobs after reporting weak first-quarter results. Siebel, which will lay off about 250 of its 5,850 workers, said its first-quarter profit dropped 93% year over year to $4.6 million, and revenue fell 70% to $332.8 million. PeopleSoft plans to cut 200 of its 8,180 workers. It had a $38.5 million profit on revenue of $460.3 million in the quarter.

Short Takes

INTEL CORP. resumed shipments of a new 3-GHz Pentium 4 chip, a week after putting them on hold. . . . MAPTUIT CORP., a Burlington, Mass.-based developer of trucking navigation systems, said it has raised $8 million in new financing.

Disk Arrays Gain in Use For Secondary Storage

But tapes continue to handle most data for backups and archiving, survey finds

BY LUCAS MEARIAN

RELATIVELY inexpensive secondary disk storage is gaining a significant foothold in corporate data centers, according to a survey of more than 1,000 IT managers that's due to be released next month. But the survey also shows that a large majority of data is still backed up and archived the traditional way: on tape.

Peripheral Concepts Inc., which released preliminary results of the survey last week, said about 50% of the respondents with disk storage capacities of more than 500TB indicated that they already use disk-based devices for secondary storage. That includes saving snapshot copies of data and staging information for archiving. Another 25% plan to start doing so within two years, the consulting firm said.

But secondary disk storage typically involves less than one-fifth of a company's total data, said Farid Neema, president and CEO of Santa Barbara, Calif.-based Peripheral Concepts. And only a small percentage of the data that's backed up on disks doesn't get moved to tape devices for archiving, Neema said. "Tape remains by far the most popular medium and does not seem to want to go away," he said.

Neema cited another potential roadblock to wider adoption of secondary disk storage: A "significant percentage" of the respondents indicated that reliability issues could prevent them from using low-cost Advanced Technology Attachment (ATA) disk drives.

Over the past 12 months, vendors such as EMC Corp., Network Appliance Inc. and Storage Technology Corp. have released ATA-based disk arrays for storage of near-line data, snapshot copies and information that will eventually be archived on tape devices.

Mike Lin, director of emerging technologies at the University of Southern California, Los Angeles, is testing StorageTek's BladeStore virtual tape server, which acts as an intermediary between systems and tape libraries.

Time for Backups

Lin said the school currently backs up 18TB of research and administrative data to Sun Microsystems Inc. StorEdge 3510 disk arrays during an eight-hour window each night. It then archives the data on StorageTek 9940 tape drives.

A terabyte of Fibre Channel disk capacity for the StorEdge arrays costs $65,000 to $90,000, depending on how it's configured, Lin said. In comparison, he said, a full 10TB BladeStore array with ATA drives costs only $40,000.

Lin didn't voice any major reliability concerns about ATA technology, but he said it takes an hour longer — about eight hours altogether — to rebuild the data on failed ATA disks than on Fibre Channel ones.

Jamie Riis, CIO at BayView Financial Trading Group LP in Miami, is using a NetApp R100 NearStore disk array to store document images. The array replaced an optical system that was slow and unwieldy, Riis said. BayView also uses the R100 to back up database files prior to recording them to tape devices, he added. ◗

Business Objects Upgrades Its Data Analysis Software

BY MARC L. SONGINI

Business Objects SA last week announced an upgrade of its data analysis software suite that it said includes a more consistent Web browser user interface plus extended capabilities for integration with ERP and CRM applications.

The Paris-based company said the BusinessObjects Enterprise 6 release will also provide a boost in performance and scalability. For example, the suite's thin-client WebIntelligence tool will provide 80% faster response times on query and analysis operations, said Lance Walter, director of product marketing for business-intelligence platforms at Business Objects.

In addition, Walter said the WebIntelligence upgrade includes a single user interface for querying, reporting and analysis functions. Business Objects has also added wizard technology to help users perform tasks such as filtering out unwanted data or drilling down into information about a specific unit. Reports can now be saved and published within Microsoft Excel spreadsheets or Adobe Acrobat documents.

Although Business Objects has sped up the log-in process for WebIntelligence and upgraded the tool's reporting capabilities, the improvements could have been even better, said Thierry Leleu, business-intelligence program manager at Unisys Corp. in Blue Bell, Pa. Unisys has been running WebIntelligence 2.7 since 1998 and began beta-testing the new version in September.

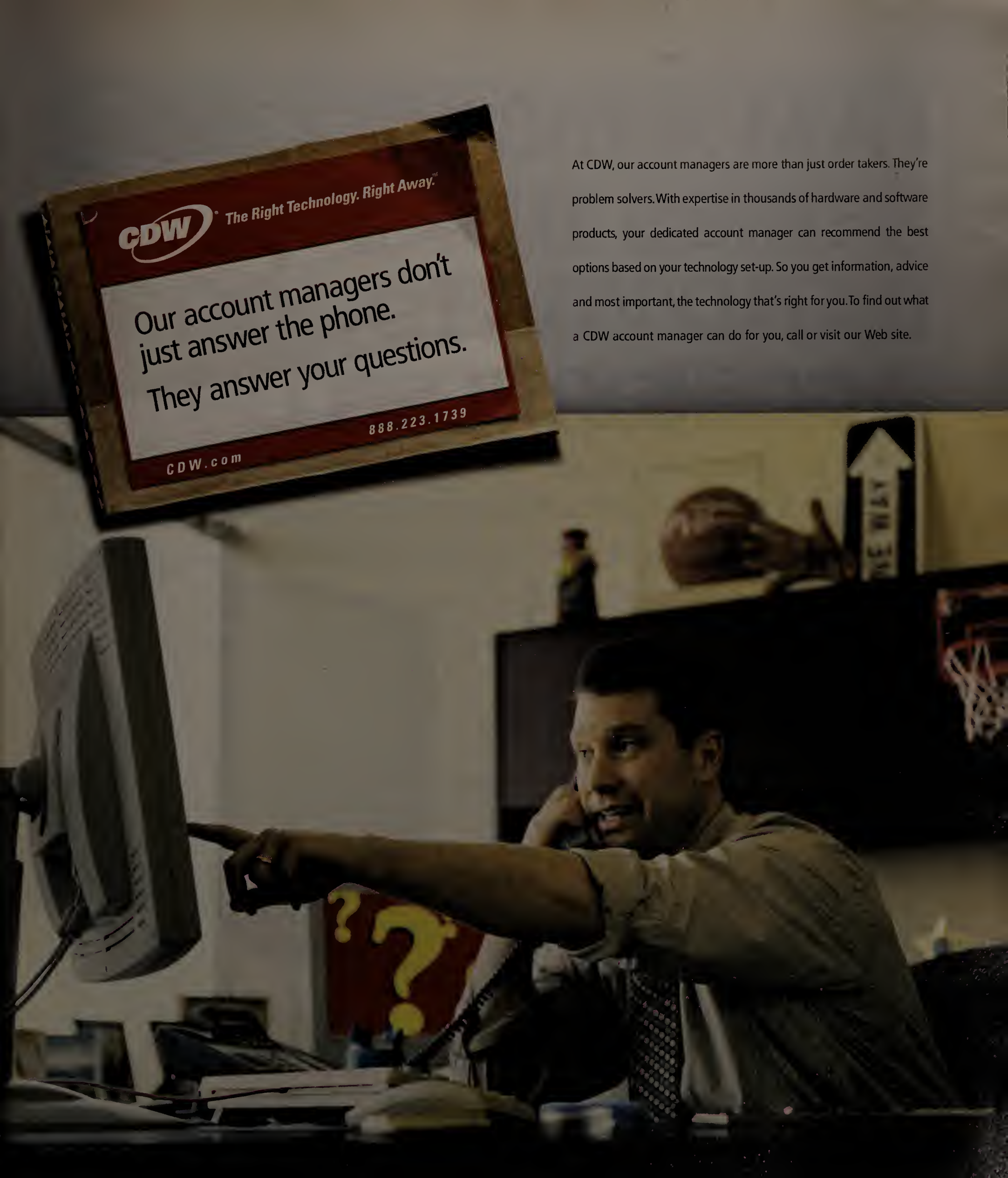
PRODUCT FEATURES

BusinessObjects Enterprise 6

- Modular data warehousing software that will be sold as a stand-alone product.
- Streamlined configuration and installation capabilities.
- Software development kits for adding reporting and data security functionality to other applications.

Leleu declined to comment specifically on what Business Objects could have done better in the upgrade. Despite the shortcomings, he noted that he hopes to get some of the 8,000 WebIntelligence users at Unisys live on the new software by July. The added support for Excel and greater flexibility in designing reports are particularly attractive features, Leleu said.

Business Objects, which has its U.S. headquarters in San Jose, said the Enterprise 6 suite is due for release by May 15. The upgrade will be able to use native interfaces to extract data from business applications developed by vendors like SAP AG, Oracle Corp., Siebel Systems Inc. and PeopleSoft Inc., as well as from custom applications. ◗



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Microsoft's Server VP Discusses Competition, Future Releases

Bill Veghte, *vice president of Microsoft Corp.'s Windows Server group, spoke last week with* Computerworld*'s Carol Sliwa about the competition the company's newly launched Windows Server 2003 faces and about his thinking on future releases. Excerpts from the interview follow:*

Do you consider Linux to be the chief competition to Windows Server 2003? On the one hand, NT 4 is a competitive framework that I look at. Solaris is, AIX is, and Linux is.

Do you view them all equally? Windows Server has three core roles: application platform, IT infrastructure and information worker productivity, [for] large enterprise, medium-size business and small business. For each one of those, I think of the competition as different.

Where Linux is getting traction is, "I've got a Unix app and I'm not doing any feature development on it. I want the cost efficiencies of x86. And I don't want to have to recompile the app in any significant way, etc. Linux looks interesting." [If] I've got a simple Web server that's just serving up static HTML, Linux looks interesting. Those would be examples of app workloads predominantly in the enterprise.

Microsoft will ship some new functionality in the coming months as add-ons for Windows Server 2003. What do you think should be free, and what should be separate, for-fee products? The philosophy that I've had is anything that has been delivered in essence out of the box in Windows Server to date, that we're effectively improving on, is available for any licensed Windows Server 2003 customer.

An example of that would be Windows SharePoint Services. I think of Windows SharePoint Services as the next-generation file server. It would stand to reason that if I think of Windows SharePoint Services as a file server, and Windows servers are naturally file servers, that would be free for any Windows Server 2003 customer.

Is there any chance you will revisit the decision about Exchange Server 2000 not running on Windows Server 2003? Nope. Not on that one. That was a decision we made based on some hard engineering realities and what we believe was the best way to solve some customer feedback.

Is this the pattern customers can expect for future versions of Exchange – that they will run only on the newest operating system? No. Boy, that statement I would hate to be true.

It was surprising just over a month ago when Brian Valentine, senior vice president of the Windows division, told us there might be a Longhorn server release, after Microsoft had said last fall that Longhorn would be a client-only release. I was shocked, too, I promise you.

Is there any new line of thinking on that topic? Yeah, I'll walk you through it, because . . . I've given Brian lots of feedback.

Here's how I think about that server release framework and what I'm trying to do for customers. When customers think about Microsoft, they want two things. They want a regular supply of innovations that are solving their problems in an integrated, comprehensive fashion. At the same time, they don't want it every 12 months. They want it at less frequent intervals. I sort of like the three-year time horizon, frankly . . . where it's going to make good business sense for customers.

So I look at this and say, There's a set of things that I want to slipstream out in the marketplace for the customers for whom it makes sense and then do a big-bang server release every couple years.

The question that the company's been wrestling with is, Are there a set of slipstreams that we can do to the server to make those more relevant? Or are we doing a big-bang release? Frankly, we've had lots and lots of discussions on it. Now that [the launch is] done, it is my highest priority over the next couple months to get that locked in. ◗

Check-Imaging Bill Spurs IT Projects at Large Banks

Firms add systems, build networks for exchanging images

BY LUCAS MEARIAN

Wells Fargo & Co. last week said it's joining the list of large banks that plan to expand their use of imaging technology to prepare for the expected passage of legislation giving electronic check images the same validity as the original paper ones for payment clearance and settlement activities.

Many banks have already adopted check imaging for their customers. But most have been slower to add technology to their back-end systems that would enable them to exchange images with other banks and payment clearinghouses for settlement purposes, according to analysts. In large part, that's because federal law currently requires banks to send paper copies of checks to one another.

But that's about to change, said Avivah Litan, an analyst at Gartner Inc. Late last month, the Check Clearing for the 21st Century Act, known as Check 21, was reintroduced in Congress. The measure, which Litan expects to win quick approval, would allow banks to exchange electronic check images and use them in place of the actual checks.

Saving Steps

Mitch Christensen, executive vice president of payment strategies at Wells Fargo, said the San Francisco-based company is beginning a six-month rollout of IBM hardware and imaging software developed by Dallas-based Carreker Corp. The technology will be installed at regional check-processing facilities around the country, Christensen said.

Carreker's suite of image processing and archiving applications lets users capture check images, control and monitor access to their image repositories and transmit the images via the Web, e-mail, fax, CDs or tapes.

At Wells Fargo, the software will run on a combination of IBM's Unix servers and its 3890/XP document-processing system.

Christensen was unable to say how much the rollout will cost, because Wells Fargo still needs to determine how much new equipment will be required to support the imaging work. In addition to the ability to eliminate exchanges of paper checks with other banks, expected benefits include faster access to checks when payment problems arise, he said.

Hank Farrar, president and chief operating officer at The Small Value Payments Co. (SVPCo), which is creating a national network for exchanging check images, estimated that the banking industry will save $2.1 billion annually by switching to imaging. Paper checks require manual handling, impose transportation costs and can slow fraud-detection efforts, he said.

In addition, delivering paper checks isn't always a reliable means of exchanging data. For instance, after the Sept. 11 terrorist attacks, all airline traffic was grounded for days, delaying or even halting the delivery of checks for processing between banks, Farrar said.

About half of U.S. checks are imaged and archived today, but that figure is expected to be close to 100% by 2007, Litan said. But another step in the process is still being addressed: creating mechanisms that will enable banks to exchange the images.

A handful of such efforts are under way. For example, Farrar said New York-based SVPCo, which is owned by Wells Fargo and 19 other banks, plans to go online early next year with eight banks. "We hope we can create an industry standard," he said, noting that SVPCo is in the midst of selecting IT vendors and network services providers to help support its network. ◗

KEY FACTS

Check 21

- The measure was proposed by the Federal Reserve System in December 2001 and was reintroduced in Congress this month.
- If the bill is approved and signed into law, there will be an 18-month implementation period until its provisions are fully in effect.

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PATRICIA KEEFE

Surviving a Sea Change

THE IT COMMUNITY, from code jockeys all the way up to the executive suite, is undergoing a sea change. The existence of everything IT, from job categories to entire departments, is up for reassessment, reassignment — and maybe even headed toward redundancy.

PATRICIA KEEFE IS A *Computerworld* editor-at-large. You can contact her at patricia_keefe@computerworld.com.

The most obvious change involves the loss of IT jobs. Many have gone abroad, and they aren't coming back. Offshore outsourcing as a percentage of IT budgets went from 12% in 2000 to 28% in 2003, according to Forrester Research. The U.S. Bureau of Labor Statistics estimates that there are now 212,000 unemployed computer and mathematics professionals. No doubt the number would be even higher but for the IT workers who have given up and moved on to different careers.

It's only going to get worse as more and more companies outsource more and more functions (see story, page 39). Meta Group is predicting that as many as 50% of all U.S. IT workers could shift to contract labor by 2007. Meanwhile, our seed corn is under siege: Fewer students are opting for computer science degrees as more corporate recruiters skip college campuses.

We have also suffered the loss of IT credibility. Massive sums of money have been spent on IT in the past five years, and many businesses remain unsure of the benefits. Large projects that failed, disasters that didn't happen, revolutions that didn't come, ROI that can't be quantified — all have dimmed the aura that surrounded IT in the late '90s.

And then there are command-and-control issues. Should the IT function be dispersed across business units? Has IT become a utility or perhaps so pervasive that having a specific department is no longer warranted? Should the whole shebang be outsourced, or is IT still too critical to corporate strategy?

There's no question that the industry is changing before our eyes. Our community needs to move past the stale debate over whether we are experiencing a wholesale sellout of IT workers or an inevitable, economically fueled evolution. The train has already left the station, and we need to figure out where it's heading from here. We need to focus on how changes taking place today will shape the next phase of this industry. Some issues you might want to consider:

■ What are your core competencies and core business needs?

■ How will your company comply with new government privacy and accounting regulations — many of which will require system upgrades?

■ How would an ever-changing group of contract workers affect your budget, project schedules, quality assurance, maintenance and upgrade processes and plans?

■ If projects are built by contract workers, should their costs be borne by the affected business units? And taking this further, do business units need to go through IT to get projects done?

■ If IT isn't the builder of projects or the supplier of labor, into what will it evolve? What kind of value will it bring to the business?

■ If key skills are outsourced abroad, who will fuel the next generation of technological innovation in this country?

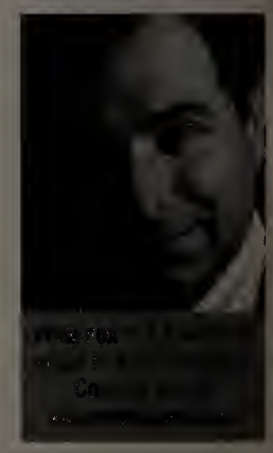
■ What new IT and management skills will be in demand?

Given that technology is the future in industry after industry, it's clear that IT will have a key role to play. But whatever that role becomes, make sure your voice is heard. You can tell us what you think by visiting the discussion forum of *Computerworld.com* [QuickLink a3070]. Help plan the future now!

PIMM FOX

Security for Web Services

THERE ARE three vital parts to the open standards underlying Web services security. There's authentication, which uses Standard Generalized Markup Language (SGML) to exchange information about a particular user. There's authorization, which grants access control via Extensible Access Control Markup Language (XACML). And, finally, there's the administration layer now managed through the use of Service Provisioning Markup Language, or SPML.



SPML automates the creation of user accounts through a role-based access-control model. Using SPML, it's possible to approve, modify and cancel accounts across the enterprise without having to manually access rules for each account. This means IT folks working on portals and application servers and in service centers have a standard mechanism for creating a request that will work throughout the organization.

For example, if you went to your supply chain partner's site to grab information stored in a back-office system, the vendor would send a response with a request using SPML to communicate with an identity management software package. The request would automatically acquire the appropriate permissions before granting you access to the data. This would happen without your having to know about your vendor's back-office system.

As part of the tool kit to build such a Web service, SPML automates the process and acts as an XML-based provisioning service, making it straightforward — at least from the user's point of view — to dynamically read things from a directory.

Darran Rolls, director of technology at Waveset Technologies Inc. in Austin (and chairman of the Provisioning

Services Technical Committee and co-chairman of the Security Standards Joint Committee at OASIS), says SPML should make it possible for companies to move beyond their tentative embrace of Web services.

"SPML is a critical piece of the security stack for Web services," he says. "It's useful to have an open-standards-based way to establish accounts."

You can learn more about OASIS and SPML at *www.OpenSPML.org*, where SPML is available for free.

The odd thing about the release of the SPML standard from OASIS is that on the surface, it would have made more sense to develop SPML before SGML and XACML. In their haste to demonstrate the cohesive security of Web services, vendors ignored the management layer. In a sense, they were so excited to identify people and give them access to a Web service that they forgot the basics of account provisioning.

Although it's great that SPML is almost here, if it had been here from the beginning, maybe Web services would be more real today instead of so much hype. ◗

THORNTON MAY

Real-Time Information Weapons

I FIND IT perversely ironic that the department most responsible for creating the dynamic real-time economy we live in today (IT, of course) continues, in many cases, to operate with Industrial Age, could-have-been-designed-by-Poppa-Joe-Stalin batchlike processes.

This situation has to change, and people are beginning to see how to do it. Researchers designing executive education classes at the Fisher College of Business at Ohio State University and the Comdex CIO "boot camp" program asked 50 IT leaders to rank key processes on the basis of being behind the curve, on the curve or ahead of the curve.

The IT process most in need of improvement on the curve is demand management, followed closely by portfolio management. These two processes directly and substantively affect the cost of IT inside a company and its perceived value — two issues sitting top-of-mind with CIOs. These two processes need to be done in real time.

IT departments are no strangers to process analysis and remediation. Indeed, several companies have asked their IT shops to apply this skill to the rest of the organization. It's now time to apply these vaunted see-the-process/improve-the-process skills to IT itself.

In 1987, my friend and research colleague William R. Synnott (then vice president of data processing at Bank of Boston) wrote the book *The Information Weapon: Winning Customers and Markets Through Technology*. In addition to writing the first print instance of the term *CIO*, Synnott presented the metaphor of the IT shop as an armory — a creator of capabilities ("information weapons") that could deliver business advantage.

THORNTON MAY is a longtime industry observer, management consultant and commentator. Contact him at **thorntonamay@aol.com.**

Information weapons create value when IT gets users to choose something important as a target and then delivers the information weapon to the selected bull's-eye. But before you start, you need to ask yourself five questions:

1 and 2. Where and by whom do IT targeting decisions get made?

3 and 4. How and when do IT targeting decisions get made?

5. Are you happy with your answers to the first four questions?

Few of us go through this basic Q&A, which helps explain why the technology management process hasn't really been integrated with project management or financial management processes.

The challenge facing those who would improve the preproject portion of the demand management process is that users don't really understand what technology can do, nor do they know how much technology has really changed.

A direct analogy can be drawn to the difference between the smart precision bombs of the current military campaign in Iraq and the dumb bombs used in World War II.

During WWII, an average B-17 bomb missed its target by some 2,300 feet. If you wanted a 90% probability of hitting a particular target, you had to drop some 9,000 bombs. That required a bombing run of 1,000 bombers and placed 10,000 men at risk (not to mention the poor souls on the ground).

In contrast, with the latest weaponry, one plane flown by one man with one bomb could have the same probability of hitting its target.

Today, we have more accurate information weapons. Many users don't know this. And even if they did, our targeting still stinks.

So the one big IT project you might want to approve this year is a real-time demand management and portfolio management system. ◗

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www.computerworld.com/columns

READERS' LETTERS

Another Look at What Lies Ahead for IT

FOR COST, quality-of-service and security reasons, Cap Gemini Ernst & Young Chief Technologist John Parkinson's fantasy of only 100 companies providing the majority of computer services to the world won't come to light, despite the greed of Ernst & Young, Microsoft, IBM and EDS in trying to control everyone's data ["The Ins and Outs of IT," QuickLink 36727].

In fact, the trend is just the opposite, toward Linux and decentralized data. This is for good reason. Microsoft became popular because the high expense, poor quality of service, arrogance and incompetence of companies' central computer departments (commonly called MIS) caused other departments to purchase their own systems, which would be under their own control.

It's unfortunate you chose to run such an article.

Bob Toxen
Chief technical officer, Fly-By-Day Consulting Inc., Duluth, Ga., bob@verysecurelinux.com

I AGREE WITH John Parkinson that new technology will be produced, but history has taught us that business doesn't move quickly to adopt the new processes that new technology demands.

Manufacturing resource planning took 15 to 20 years to really grab hold, and today there are many companies that have not moved to ERP, though they should have.

Paul E. Miller
Partner, Computer Sciences Corp., Cheshire, Conn., pmille32@csc.com

Taking Advantage Of Mainframe Skills

THE ARTICLE "Mainframe Brain Drain Looms" [QuickLink 37362] certainly reinforces some of the issues I have found over recent years. However, I would like to suggest another spin on this. A lot of the skills that mainframe data center personnel have are in fact the same skills lacking from open-server data centers. The idea of properly organized shifts with actual operators to monitor and manage those systems just doesn't exist. You routinely see highly paid staff like sysadmins or DBAs doing the work that a console or system operator would do in a mainframe world.

The problem is a cultural one – a failure to put things together so that it can be handed over to operations staff to take care of using the simple, functional interface and procedures you have provided.

In fact, I am constantly amazed at the amount of time spent reinventing what the mainframe – because it grew from the idea of stability and reliability being No. 1 to the organization and user – already had.

Peter Dominey
Independent Unix contractor, Dallas, pdominey@dominey.biz

YOUR ARTICLE "Mainframe Brain Drain Looms" startles me. It gives the impression that employers are wringing their hands in deep concern that they will be unable to find local talent.

If such a shortage exists, why aren't there more ads requesting mainframe skills?

I. Federman
Lake View Terrace, Calif.

REGARDING the article "Mainframe Brain Drain Looms," it's true that those of us with mainframe skills are generally over 50. However, if there is a shortage, why is it that none of us can find a job? Could there possibly be some age discrimination in the marketplace?

M. Shepard
IT manager, Noroton, Conn.

COMPUTERWORLD welcomes comments from its readers. Letters will be edited for brevity and clarity. They should be addressed to Jamie Eckle, letters editor, Computerworld, PO Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax: (508) 879-4843. E-mail: letters@computerworld.com. Include an address and phone number for immediate verification.

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Dr. Tim Grieser is responsible for performance and availability management software research in IDC's Enterprise Systems Management Software program. His coverage includes service level management for systems and applications across a wide variety of platforms.

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ask THE EXPERT

A few minutes with Tim Grieser, VP, Enterprise System Management Software Program, International Data Corp. (IDC)

Fight Data Center Complexity with Self-Managing Servers

> We now hear the terms "self-managing," "self-healing," "self-protecting," "self-optimizing," "self-configuring," "policy-based," "holistic," "introspective," "autonomic" and "smart" computing for systems management software — what does this all mean?

All of these terms refer to putting more system management intelligence into software tools, so that problem detection, diagnosis and response can be performed automatically in an increasing number of cases.

> Just how real and proven are the lofty claims of vendors about self-managing IT infrastructures?

Quite real. Some aspects of self-management have been successfully implemented in production environments for a number of years. For example, scripted responses (such as re-booting a server) to fix common problems (such as running out of available memory space) are commonly deployed. Techniques such as event correlation are used to help determine which of several events is most likely to be the fundamental or "root cause" of a problem.

> Why is this all so important and what are the most significant benefits to the enterprise?

What is really important in today's complex, distributed environments is to simplify the job of system management. With increasing platform complexity, and constraints on IT budgets, IT professionals such as system administrators are being asked to manage more and more infrastructure elements, such as servers, in less time. Indeed, "doing more with less" is a common job requirement for system administrators these days. Intelligent system management software can simplify the job of administrators by automating responses to known types of problems, thus reducing the number of situations that require manual intervention by the IT expert. Benefits to IT include cost savings, the ability to "scale" to manage ever increasing numbers of servers and server images, and improved service levels such as system performance and availability.

> How does an enterprise implement these capabilities across dissimilar platforms, and are standards important?

Typically, there will be platform-specific management components (such as monitoring agents for Windows and Unix servers) linked to common management components such as "consoles." The common management components often deal with automatic responses to events, and also work with higher level constructs, such as applications and end-user views. Standards are useful in that they can enable easier data gathering, such as monitoring, across platforms. Also, system management tools often use standards to communicate information from basic monitors to higher-level management consoles.

"What is really important in today's complex, distributed environments is to simplify the job of system management."

> What can we expect from this technology three years from now?

The direction is clearly toward higher levels of automated responses, not only to fix operational interrupts or breakages, but also to address dynamic management of resources (such as dynamic load balancing and provisioning servers as needed) in order to achieve desired service levels. More and more, the objective is to reduce manual intervention to diagnose and fix problems, so that higher levels of scalability, performance and availability can be achieved.

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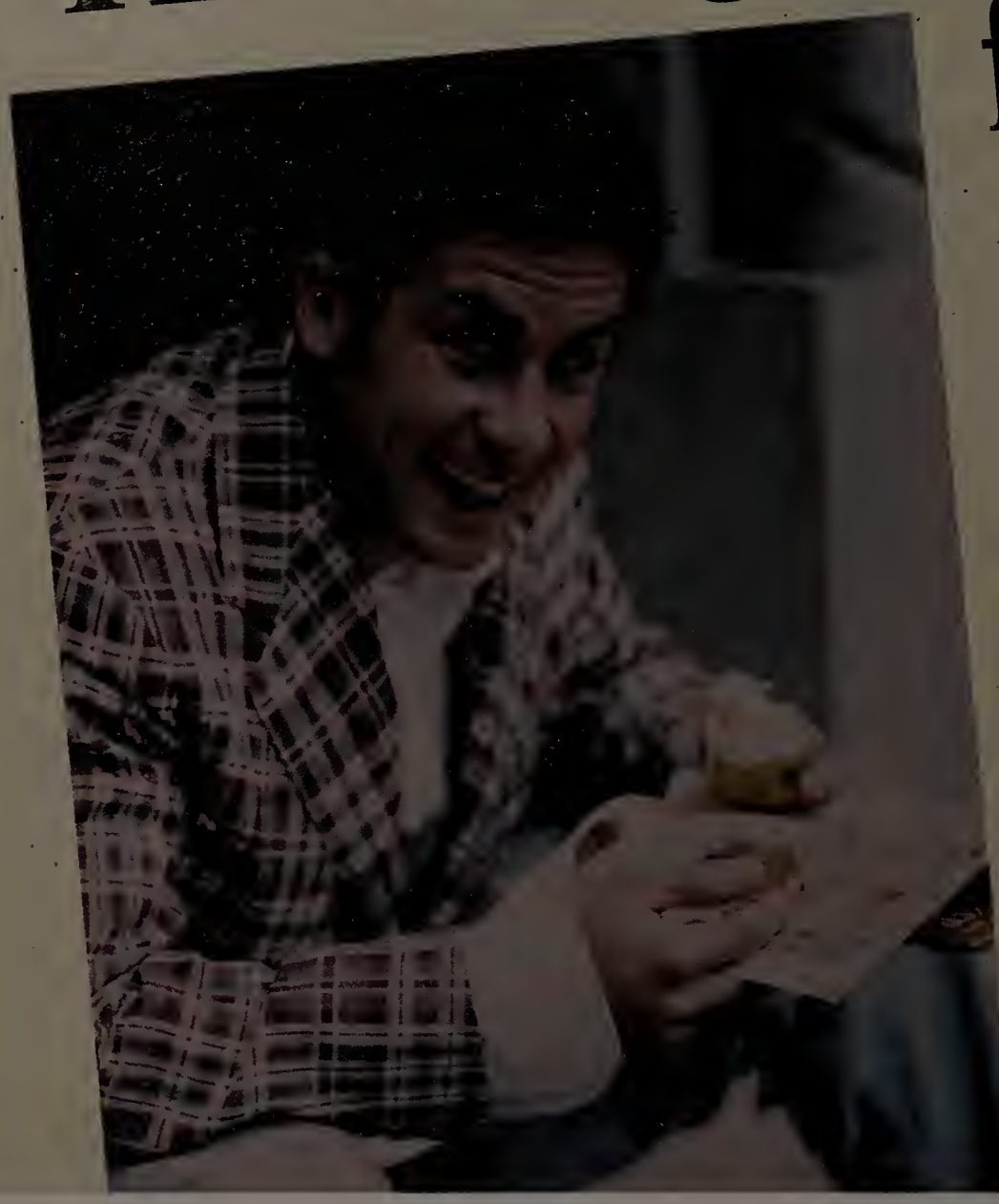
IT manager leaves office for lunch



After deploying a firewall and intrusion protection solution from Nokia, Daniel Heslip confidently leaves building for one full hour

According to sources, at 12:10 pm on Friday, Heslip approached reception and proclaimed that he was "going out for a bit." "No one took him seriously," said Nora, senior receptionist at the time. "But, then I noticed that he actually walked out the door, and he was gone for a whole hour."

Pre-installed, Pre-configured and tested

Before Nokia, Heslip claims he didn't have the flexibility or control to manage all the details of his network's security system. "What's so great about the new system? Well, for one thing, a lot like this new burger place I just discovered, whatever platform you buy can be scaled

need extra energy, you just ask them super-size it for you. They are tota flexible," says Heslip, "and, delicio It was a pretty easy choice rea Nokia's Internet security solutions co pre-installed, pre-configured and compatible with my IP netwo Implementation was easier t choosing lunch today, I'll tell that right now." Whether it's scalability of the Nokia platform the built-in IP routing function one thing is certain, it's allo IT guys to experience basic d day activities that the rest of s takes for granted.

"Nokia also has 24-hour, seven week global support, which just that if I need help I don't have

Find out why IDC recently reported that Nokia had captured top spot in the most competitive firewall appliance segment.

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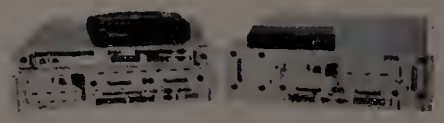

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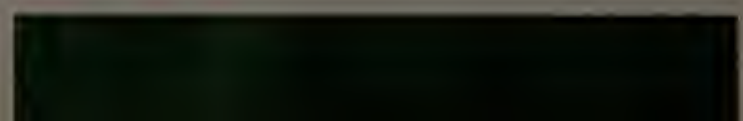

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IDC, Worldwide Security Appliance Market Forecast and Analysis 2002 - 2006: Hardware Continues to be the Choice of Security Software Deployment, November 2002.

VPNs Made Easy

Secure Sockets Layer virtual private networks make accessing Web-enabled applications as easy as launching a browser. But other applications still require client software, so you may end up using an IPsec VPN as well. **Page 28**

QUICKSTUDY

Blogs

A weblog, or blog, is a Web site where an individual records his own thoughts and opinions as well as comments from others and offers links to other Web resources. **Page 30**

SECURITY MANAGER'S JOURNAL

Merger Security Hinges On Gateway Appliance

An integrated security gateway appliance could provide interim access between Mathias Thurman's company and one that it's acquiring, without compromising security. **Page 32**

BENOIT LAVERDIERE

WINDOWS SERVER 2003:

EARLY USERS TAKE THE PLUNGE

Four beta users say the migration brings efficiency gains but requires careful planning. By Carol Sliwa

MICROSOFT CORP. launched its long-delayed Windows Server 2003 operating system last week, but some users couldn't wait.

Nasdaq Stock Market Inc. and JetBlue Airways Corp. jumped from Windows 2000 Server to the Windows 2003 beta to gain a performance edge and pursue server consolidation.

Meanwhile, the Kentucky Department of Education (KDE) and Intrawest Corp. took the plunge in hopes that Active Directory would help rein in the many domain controllers they had with Windows NT 4.0.

Windows Server 2003 promises improvements in performance, scalability, reliability, security, manageability, networking and its integrated .Net development framework. But migrating to a new server operating system is no snap for any IT shop, once the planning, testing and potential disruption to end users are factored into the equation.

All four of these early adopters said they realized benefits from migrating to Windows Server 2003, but they also expended months of effort to make sure they did. Plus, as participants in Microsoft's joint development or rapid adoption programs, they received special assistance to ensure that their projects went smoothly.

Careful assessment and planning will be crucial for any company migrating to Windows Server 2003, in order to realize the full business benefits and justify the expense in a tough economy, analysts and consultants say.

IT managers need to step back and envision the future, advises Chris Burry, a technology infrastructure practice director at consultancy Avanade Inc., a Seattle-based joint venture between Accenture Ltd. and Microsoft. Burry says IT shops should weigh questions such as what role directory services will play in their business and how those services can enable provisioning, security and management. "If you look at what you need the infrastructure to do," Burry says, "that's the best way to organize your migration."

Directory Drives Migration

For organizations using NT 4, such as the KDE, Active Directory is often the first step of the migration. KDE had over 300 Windows NT 4.0 domains and more than 2,000 domain controllers dotting the state's 176 school districts and 1,400 schools, and the distributed systems had become tough to manage and patch, particularly from a security standpoint.

Chuck Austin, project manager of the Kentucky Education Technology System, says both IT staffers and school superintendents saw the benefits of using Active Directory to centrally manage critical network resources and deliver services. Their goal is to improve security, reduce recurring costs and complexity, stabilize backbone services and lay a foundation for better collaboration among the state's 600,000 students and 100,000 teachers and administrators.

To preserve local autonomy, the IT department will delegate authority for managing users, computers and groups to network administrators in the districts, Austin says. Each district will have at least one Windows Server 2003 domain controller and a global catalog server, and about 20 districts are expected to continue to run Novell Inc.'s NetWare in tandem.

Tim Cornett, the KDE's Active Directory lead architect, says the directory migration to Windows Server 2003 has been easier than it would have been with Windows 2000 Server because he doesn't have to manually create connection objects for replication between domain controllers.

In Windows 2000, the process that

automatically creates replication connections between domain controllers can't be used when a forest of Active Directory domain trees contains a large number of sites. Administrators must create and maintain intersite replication topologies.

Cornett says guidelines advise companies with large deployments to turn off some of the automated features in Windows 2000 Server. But he shouldn't have to do that with Windows Server 2003, because the new Inter-Site Topology Generator uses improved algorithms and can scale to support a forest with a greater number of sites. Cornett says that will save a tremendous amount of work. It will also lessen the expensive bandwidth for replication to 176 districts, Austin adds.

Another overall benefit from the Active Directory migration, which is due for completion by year's end, will be the reduction of the 2,000-plus domain controllers to 400 and the 300-plus domains to 178, Austin says. When the KDE migrates its 320 Exchange and 700 Web servers, it hopes to achieve server consolidation, he adds.

MATTHEW DUNN: Intrawest aims to go from 130 domain servers to 40.

Domain Servers Reduced

Intrawest has about 130 Windows NT 4 servers involved in domain and security tasks. But the IT department is aiming to reduce the "god-awful mess" to 40 dual-processor Dell Computer Corp. PowerEdge 2650s running Windows Server 2003 Standard Edition, says Matthew Dunn, CIO at the Vancouver, British Columbia-based resort operator and developer. He says the company's 35 active domains — with a "snake's nest of trust relationships" among them — will be cut to two, thanks to six months of careful consideration and planning.

One challenge that Intrawest encountered in figuring out the best way to address the problem was wading through the boatload of documents that Microsoft makes available to customers. "Microsoft is almost guilty of supplying too much information," Dunn says with a laugh. "Microsoft Consulting Services was helpful, in part, as a guide in the wilderness of documents."

Plans call for Intrawest's Microsoft and in-house applications to be migrated from Windows NT and 2000 to Windows Server 2003 over the next two years. Dunn says he wants a .Net-centric architecture to pave the way for the Web services he hopes will help disparate systems talk to one another through XML and SOAP. "Because of the performance gains," he adds, "there's an opportunity to pursue consolidation as well as migration."

Shrinking the Web Server Farm

Steve Randich, CIO at Nasdaq in New York, says Nasdaq.com saw a 25% to 30% boost in performance running Windows Server 2003. That enabled his staff to consolidate 75 four-processor Dell Web servers to 35 servers. Stress-testing tools from Mercury Interactive Corp. in Sunnyvale, Calif., showed that the servers can handle more sessions and users. "We pay less maintenance when we have less boxes in production," Randich says, adding that he also expects to reduce licenses.

Application code has run more reliably, and servers required fewer patches than Windows 2000 Server did during its beta period, says J.P. Athey, vice president of Nasdaq network and Web technology. He says migrating Web servers still involves the typical intensive testing effort, but he found it "more seamless" than the move to Windows 2000 Server.

Server consolidation, performance, enhanced security and total cost of ownership benefits will be the key drivers when Nasdaq looks to migrate other Web, database, transaction processing and application servers from Windows 2000, Athey adds. Nasdaq, which is doing a server consolidation study with Hewlett-Packard Co., hopes to go from 1,100 servers to 700, he says.

STEVE RANDICH: Windows Server 2003 improved Nasdaq's Web site performance.

Rick Fricchione, vice president of Microsoft services at HP, says IT shops often start with migration and move to consolidation to cost-justify the upgrade. But he warns that they need to focus on service management, availability and reliability once there are tens of servers each supporting 1,000 users, rather than hundreds of servers handling 100 users each. "The biggest gotcha we've seen is understanding that you're much more mission-critical when you come out the other end," he says. "Instead of having 100 people impacted when a machine goes down, you may have 1,000 impacted. So operational best practices matter greatly."

Boosting Scalability

Improvements to Windows' Distributed File System (DFS) were a major impetus for JetBlue Airways to upgrade to Windows Server 2003. The Forest Hills, N.Y.-based airline relies on DFS services to distribute electronic manuals to pilots as part of its paperless cockpit initiative.

JetBlue CIO Jeff Cohen says DFS replication in Windows 2000 Server sometimes didn't work "as advertised" in updating changes made in the root folders. But the new version of DFS fixes the problem and affords more granular control over replication, he says.

An all-Microsoft shop, the 3-year-old airline likes to run the latest technology and regularly participates in Microsoft's joint development and rapid adoption programs. JetBlue sometimes runs 40% of its systems on beta software, Cohen says, but there's minimal risk because Microsoft "is standing by your side." By May 19, JetBlue will have devoted over 5,000 man-hours to testing, planning and developing applications for Windows Server 2003. Its migration of 250 Windows 2000 servers started with the "extremely smooth" upgrade of 22 domain controllers, he says. One of the few minor issues was that HP's SmartStart setup utility wasn't ready to help configure the servers, Cohen notes.

JetBlue is also shifting mission-critical applications to Windows Server 2003 Datacenter Edition on Unisys Corp. ES7000 boxes, including two running 64-bit Windows Datacenter on Itanium 2 processors. The company has three ES7000s in production and four more in the works.

Next month, JetBlue will go live with the new 64-bit SQL Server 2000 for its frequent-flier program, a move Cohen likens to doubling the size of a highway during rush-hour traffic. The company also plans to run its entire Web server front end on ES7000s. "These servers can give five 9s of reliability," Cohen says. "We're running an airline. We cannot afford to be down."

But Avanade's Burry warns that Datacenter may not be the right choice for every IT shop considering Windows Server 2003. Each company will need to carefully weigh the economic impact of downtime, he says.

"As you drive up the availability, you also drive up the cost," Burry says. "There are places where Datacenter Server is absolutely marvelous. But it needs to be connected to the requirements of your business."

SHOULD YOU UPGRADE?

Windows Server 2003 has been described as not much more than an incremental upgrade to Windows 2000 Server. But some users and analysts say a few key features set it apart, such as the following:

Active Directory improvements, including cross-forest trust, domain rename and schema redefine capabilities, more efficient replication and synchronization, a new group policy management console and new group policy settings, and the ability to load directory content from backup media such as CDs, DVDs and file copies without replicating across the corporate network.

Enhanced security, including the lockdown by default of Internet Information Server 6.0 and a new Internet Connection Firewall to protect and monitor traffic between the network and the Internet.

Internet Information Server 6.0, which is based on a new request-processing architecture. It provides an application isolation environment to prevent one application or site from stopping another and to reduce the time needed to restart services.

Volume Shadow Copy Service, which enables rapid "snapshot" backups of servers without disrupting applications.

Built-in .Net Framework support, along with native support for Web services standards such as XML, SOAP, Web Services Description Language and UDDI.

Support for 64-bit computing in Enterprise and Datacenter editions.

Windows System Resource Manager, which lets IT managers allocate CPU and memory on a per-application basis.

More scalable, efficient Distributed File System allows multiple DFS routes to be hosted on each server; during system failure, a server fails to the nearest available server.

MIGRATION HELPERS

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VPNs Made Easy

SSL virtual private networks are simpler to set up than traditional IPsec VPNs, but most organizations will probably end up using both. By Alan Radding

PHYSICIANS AT CATHOLIC HEALTH SYSTEM in Buffalo, N.Y., want access to medical information and images. Managers at Perry Manufacturing Co. in Mount Airy, N.C., need remote access to e-mail and applications running on an AS/400. At these businesses and elsewhere, users are becoming increasingly reliant on remote access to business applications and data.

Yet even in the era of the Internet, there has been no easy and secure way to provide remote access to the data and applications users need. Dial-up connections, terminal emulation tools, Internet portals and traditional virtual private networks (VPN) can do some of the job, but each has its limitations.

"We had an old dial-up product to reach the AS/400, but no e-mail," recalls Howard Ward, Perry's director of information systems. The company had Cisco's Easy VPN for e-mail but found it to be too slow, he adds.

Catholic Health wanted to give physicians remote access to patient information and medical test results. Its first attempt — sending medical information and images via fax — proved cumbersome. Then it deployed a VPN based on the IPsec protocol. That provided session encryption and authentication and enabled network-level access to resources, but it also proved problematic. "Some physicians still use our VPN, but there are real support issues. You need to configure software on each client. What we wanted was an application-level gateway of some sort," explains Douglas Torre, director of networking and technical services at the health care services provider in western New York.

Both he and Ward have turned to Secure Sockets Layer (SSL) VPN appliances, which provide that application-level gateway by allowing remote access over the Internet to Web-friendly applications.

No-Hassle VPNs

While IPsec VPNs provide broad, flexible network-level access, SSL VPNs let remote users access specific applications over an intranet or the Internet using a Web browser. In its purest form, the SSL VPN is clientless, relying only on a Web browser to run any application that can present an HTML interface. In other cases, users may need to download a browser plug-in, such as a Java or ActiveX component, in order to access a specific application.

Like its IPsec counterpart, the SSL VPN establishes a secure channel of communication. But it terminates the session outside the corporate firewall, usually to a server or appliance in the DMZ (the "demilitarized zone" between the secure corporate network and the public Internet). The user sessions then pass through to various internal systems using the appropriate interfaces and protocols.

In contrast, IPsec VPNs typically require the installation and management of complicated client software. These setups can be difficult and expensive to manage, especially if client machines aren't under the IT organization's control, says David Thompson, a senior research analyst at Stamford, Conn.-based Meta Group Inc. And when it comes to remote access, users are frequently beyond IT's reach, using their personal systems at home or public systems like those at Internet cafes or airports.

In addition to the need to configure the client software, says Torre, "there are security policy issues and access issues you have to keep dealing with." In comparison, Virtual Instant Extranet, an SSL VPN appliance from Neoteris Inc. in Mountain View, Calif., proved to be fast and simple. "We got Neoteris running in less than an hour. Users just go with their browser," Torre says.

Performance is another potential problem with conventional VPNs. "We were running our Cisco VPN on a big box, and it was still slow," says Ward. Efforts to tweak the VPN had no affect, and users

Clientless VPNs Give The Help Desk a Lift

IT managers say the biggest advantage of an SSL VPN lies in its ability to relieve the headaches they face in supporting users of traditional VPNs

Brian Dennis Gaon, manager, IT security at North Shore – Long Island Jewish Health System, says supporting IPsec VPN client software on machines belonging to thousands of doctors and clinicians was a "huge effort," and the VPN client software was almost always at the root of problems. An EX-1500 SSL VPN appliance from Aventail has significantly reduced calls to the help desk. "There is no client software," Gaon says, and the new VPN now handles 80% of the organization's remote access needs.

Anne Winder, webmaster at Quidel Corp., a San Diego-based medical diagnostics provider, says shifting users from a traditional VPN to an SSL appliance from Emeryville, Calif.-based SafeWeb Inc. cut support-call volume by 30% after a partial rollout. Quidel now plans to offer SSL VPN access companywide. But the implementation isn't entirely clientless: It uses downloadable ActiveX components for access to the company's e-mail, file servers and Web applications, she says.

– Alan Radding

still couldn't reach the AS/400. Ward installed FirePass from uRoam Corp. in Sunnyvale, Calif., and that appliance improved performance while delivering access to both e-mail and AS/400 applications. The AS/400 applications required a one-time client download of an ActiveX component.

IPsec VPNs establish a network-level connection and therefore need to punch through the firewall. That's a problem when remote sites won't open their firewalls, notes Malvin Mize, hosting and access team leader at Acxiom Corp., a vendor of information management services in Little Rock, Ark. Using the SSL VPN capability supported in Tarantella Inc.'s thin-client software, however, Acxiom's remote customers can sit at any Internet-connected device and, via their browsers, connect to the company's Tarantella Enterprise 3 server, which provides secure thin-client access to the back-end Windows applications Acxiom hosts. There's no need to open another port in the firewall at the customer site, since all traffic passes through HTTP Port 80, Mize says.

The Downside

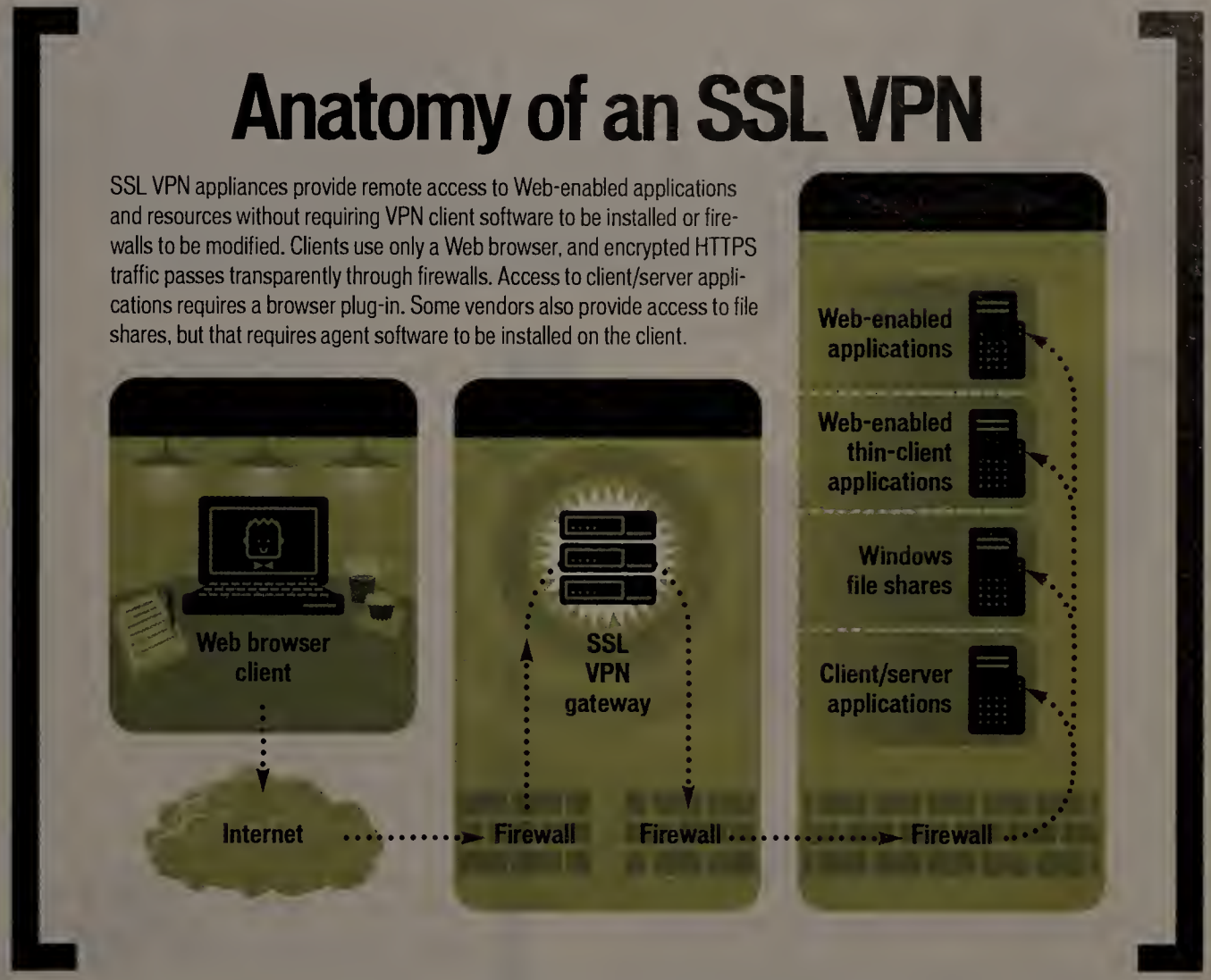
"IPsec is the mainstream approach, but it's not suitable for every remote access situation," says Jim Slaby, an analyst at Giga Information Group Inc. in Cambridge, Mass. But although an IPsec VPN increasingly isn't necessary for many remote access needs, it still has a role in most organizations. "SSL solves all the remote access issues except one:" providing access to client/server or other applications not accessible from a browser, Slaby says.

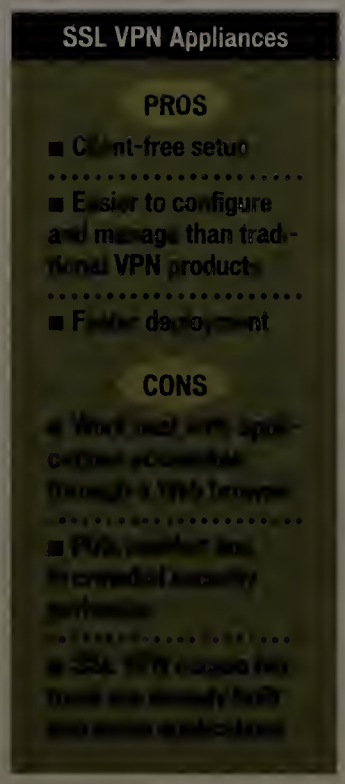
Unlike IPsec VPNs, SSL VPN appliances don't typically allow direct access to network file shares. One vendor, Seattle-based Aventail Corp., provides client software to access shared files on Windows servers. But that requires loading client software and doesn't support Network File System (NFS), which is commonly used on network-attached storage appliances.

With organizations increasingly Web-enabling their client/server and legacy applications, browser-only access is less limiting than it once was. But SSL VPN and application vendors have also come up with other work-arounds, such as adding client software or embedding proxy capabilities into appliances.

"Originally, the thinking around SSL VPN was to give every application a Web front end, but now you can just put in a gateway at the edge of the network," says Lisa Phifer, vice president of Core Competence Inc., a consulting firm in Philadelphia. The Web SSL session ends at the gateway, which then connects to whatever back-end application is requested. The gateway handles any necessary transformations or conversions and presents an application interface to the client.

On the back-end server side, Meta's Thompson identifies several possible gateways. They include Web proxies, which may dynamically rewrite Web addresses, masking internal addresses for security purposes; transactional proxies, which translate HTTP for use with File Transfer Protocol, SMTP and other applications; Socks-based proxy servers, which require client-side ActiveX controls or Java applets to enable access to client/server applications; screen scrapers, which reformat terminal-session displays for Windows or browser clients; and Windows thin-client systems, like Fort Lauderdale, Fla.-based Citrix Systems Inc.'s MetaFrame and its NFuse front-end software for Web browser access. Some functions may be embedded in SSL VPN appliances and associated client software, or a separate proxy server may be required.





Most users need access to a range of applications, so vendors have responded by putting different combinations of features into their products. Vendors also differ in the level of product manageability offered and in how easily their products can tie into an organization's existing directories for authentication and authorization.

With a proxy server, Java or ActiveX client components may be downloaded automatically the first time the user accesses the resource. This is how remote users typically access e-mail with Microsoft Exchange or Lotus Notes. On the back end, some sort of transactional proxy, such as Microsoft's Outlook Web Access server for Exchange Server, may be required. And companies that need to provide remote users with only e-mail access may find that newer products, such as the forthcoming Exchange Server 2003, include their own SSL VPN services.

By using thin-client intermediaries such as NFuse, users can access back-end Windows applications. Both Tarantella and Citrix also offer their own SSL-encrypted remote access options for their thin-client products. (Citrix also recently announced its own SSL VPN software offering, called Secure Access Manager.) But not all companies want the extra complexity and expense of adding a thin-client layer to their IT infrastructures just to allow remote access to client/server and Windows applications.

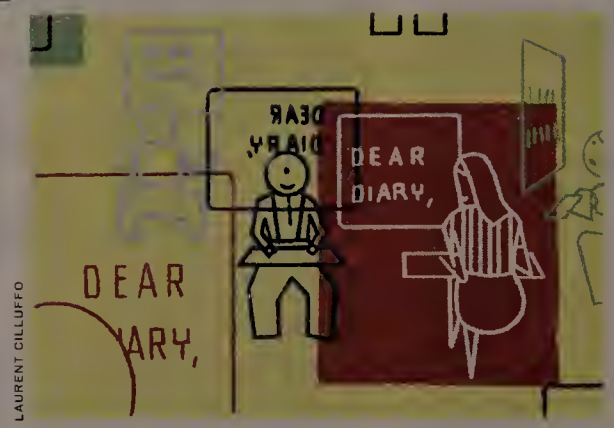
The SSL VPN market continues to expand as vendors rush into the space, but the future of many of them is questionable, analysts say. "The market will coalesce around a few," says Slaby, who expects large network-equipment and IPsec VPN vendors to sweep into the SSL VPN market.

Eventually, SSL VPN functionality may simply be incorporated into other network security products. "There will be consolidation of the infrastructure at some point," says Thompson, and users may see SSL VPN features merge into firewalls, portal gateways or other network-edge devices.

An SSL VPN appliance makes secure remote access easier, but it's not indispensable. "Much of the functionality of remote access can be achieved with the use of tools that many organizations already use in their customer-facing applications," Thompson says. By using security tools, portals, Web access control tools and SSL-enabled applications, some companies might avoid buying SSL VPNs altogether.

Radding is a freelance writer in Newton, Mass. You can reach him at alanradding@attbi.com.

Blogs



LAURENT GILLUFFO

DEFINITION

A **weblog**, or blog, is a Web site where an individual records his thoughts and opinions, comments from others and links to other Web resources. A blog can be a personal journal or an interactive forum. Most are public and searchable on the Internet. Some companies maintain public weblogs as communication vehicles for employees.

BY RUSSELL KAY

DIARIES, journals, columns, essays, musings, daybooks, chronicles, logs and memoirs — all are ways in which people have kept records of their thoughts and feelings as well as events taking place around them.

In our computer-literate, information-based society, the creation of an electronic equivalent of these personal journals was inevitable. It's called the weblog, often abbreviated to blog, and it has expanded the possibilities for comment, expressing opinion and public discourse.

Traditional diaries come with lockable straps designed to keep others from reading one's private thoughts. In today's world, however, attitudes toward such privacy seem, on the whole, quite different than they used to be. Weblogging represents a distinct movement to share thoughts publicly.

Early weblogger and developer Dave Winer (*www.scripting.com*) says weblogs have the following characteristics, which he sums up in the phrase "personal Web-based publishing communities":

■ **Personal.** Blogs are created by a single person, expressing a distinct personality.

■ **Web-based.** They're frequently updated, inexpensive to maintain and accessible via a Web browser.

■ **Published.** Automated publishing tools help the author present his words in an attractive format, and maybe even syndicate them.

■ **Communities.** Blogs link to other blogs and sites, acknowledging that they're part of a larger world.

One other category of weblog is a community blog, which is generally updated frequently by many people and often has an imposing presence. The best-known and perhaps earliest example of this type is *www.slashdot.com*, a good site for news and sometimes offbeat commentary on Linux, open source, gadgets, privacy and other computer-related topics.

Weblogging has been around as a distinct form of communication since the 1990s. By one account, the first bloglike page, with personal comments and links, was Marc Andreesen's "What's New" page for NCSA Mosaic in June 1993 (*http://archive.ncsa.uiuc.edu/SDG/Software/Mosaic/Docs/old-whats-new/whats-new-0693.html*).

QUICK STUDY

Jorn Barger coined the term *weblog* in December 1997 for his "Robot Wisdom Weblog" (*www.robotwisdom.com*), and in 1999 the shortened form, *blog*, appeared.

At the beginning of 1999, the best-known list counted 23 weblogs in existence, though there were certainly others. In early January 2003, Pyra Labs in San Francisco reported over 1 million registered users of Blogger, its free software and hosting site. (One month later, Google Inc. bought Pyra.)

The Impact of Blogging

Most webloggers seem to be avid readers of other blogs and maintain links to them on their own weblog pages. Many Web sites exist just to aggregate links to blogs, often on a geographic or topical basis, and many weblogs are members of Web rings — linked sets of Web sites that provide navigation to one another. Surprisingly, many webloggers don't seem much concerned with computers except as a simple tool.

To understand the power of the blogging community, ponder what some consider racist comments made by Sen. Trent Lott about retiring Sen. Strom Thurmond and reported by ABCNews.com last year. The first people to comment on the situation were a couple of politically minded pundits who discussed it at length in their blogs over a weekend. The issue spread quickly in the blogging community until the national news media was forced to examine Lott's remarks and history. The result was Lott's resignation as majority leader of the U.S. Senate.

It's also hard to overestimate the importance of personal narratives and statements in recording history. From Samuel Pepys' notes on life in 17th century England to Anne Frank's diary about her experiences in World War II Amsterdam, records of private experiences and thoughts are crucial to understanding the cultures and times in which they were written.

PR Move

A recent development is the use of public weblogs as vehicles for business communications. In his own blog, Dan Bricklin, author of VisiCalc and founder of Trellix Corp. in Cambridge, Mass., comments on the usefulness of public blogs: "A normal part of the job of many consultants entails going to meetings and conferences and being active in trade associations where they 'network,' show off their expertise, appear on panels, etc. A blog is a way of showing your expertise and establishing yourself as a trustworthy authority without doing the travel. . . . (A blog is an excellent way to build up your 'authority' and move up politically in a trade association, too. Your readers would be others in your field, not customers.)"

For example, in January, Jupiter Research, an arm of Jupitermedia Corp. in Darien, Conn., started posting its analysts' weblogs, hosted from a common page (*weblogs.jupiterresearch.com*).

Starting Your Own

Probably the easiest way to start a weblog of your own is to go to Pyra's site at *www.blogger.com* and sign up. The site will lead you through the necessary steps to set up your weblog. Blogger doesn't charge for its basic service unless you want your own domain name, but it does offer upgraded services at a price. Other sites offering similar services (not tested by the author) include *www.pitas.com* and *www.diaryland.com.*

Software Tools For Blogging

Blogger
www.blogger.com

WebCrimson
www.webcrimson.com

Radio UserLand
http://radio.userland.com/

Blosxom
www.raelity.org/apps/blosxom
(A complete blogging application in 61 lines of Perl.)

CityDesk (for Windows)
www.fogcreek.com/CityDesk

Tinderbox (for Macintosh)
www.eastgate.com/Tinderbox

Movable Type
www.movabletype.org

BigBlogTool
www.bigblogtool.com

Kay is a Computerworld *contributing writer in Worcester, Mass. Contact him at russkay@charter.net.*

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Merger Security Hinges On Gateway Appliance

The best short-term fix for handling acquisitions may be to use an integrated security product. By Mathias Thurman

SECURITY MANAGER'S JOURNAL

OUR COMPANY is frequently involved in mergers and acquisitions, and we typically don't know the security posture and integrity of the IT resources in the company we're acquiring.

In the past, rather than conducting an upfront security audit, we simply opened the floodgates to allow network traffic to flow from the acquired company into our trusted environment. In one case, that allowed a virus to propagate through several parts of our network, requiring many hours of cleanup.

A security audit could have prevented that. But unless an upfront audit is written into the acquisition agreement, it can't be started until after the merger or acquisition is completed. Many target companies resist such upfront agreements, however, fearing the loss of sensitive information if the deal doesn't go through.

But that's not the worst of it. Once the acquisition deal is signed, the executive staff is in such a rush to integrate the companies that security assessments typically take a back seat to bottom-line profitability concerns.

Fear of the Unknown

It's difficult to determine the integrity of another company's infrastructure prior to establishing a trust environment between our environment and theirs. Here's what usually happens: The network team configures a dedicated circuit to the acquired company, throws up a firewall and asks the acquired company to configure its servers to set up trust relationships with ours. The most important goals are to give new employees access to our e-mail, human resources applications, company intranet and a few other critical applications. If the company we are acquiring sells a software product, its engineering team also needs access to our source code — our company's bread and butter.

What we fear most is that the newly introduced resources may be infected with a virus. It's also possible that the other company's servers don't meet our security configuration requirements and are vulnerable to an attack, or have already been compromised.

I've seen incidents where the e-mail server at the acquired company had been fully compromised when someone added a packet-sniffing device to the network. The company had contracted out the installation and configuration of its e-mail server, and no one on staff was capable of managing the resource. The server was never maintained properly, so the packet sniffer went unnoticed for more than three months.

We need a security gateway product that can act as an interim measure . . . mitigating the most common problems we might encounter during an acquisition.

We need a security gateway product that can act as an interim measure until a full assessment can be completed, mitigating the most common problems we might encounter during an acquisition. We want something that offers good protection at a low cost and with few hardware requirements. The product must also be easy to manage.

We have other requirements as well. In the past, each company that we've acquired has had fewer than 200 employees and used minimal bandwidth. This is important, because any gateway product must be able to cope with expected traffic levels.

Symantec Gets the Nod

After a search, we selected the Symantec Gateway Security appliance from Symantec Corp. in Cupertino, Calif. This appliance combines virus protection, Internet content filtering, a virtual private network and an intrusion-detection system in one box.

We planned to buy several appliances and preconfigure them for easy and rapid deployment. We planned to use them only until we had validated the integrity of an acquired company's infrastructure. Then we would remove them, apply our current standards and put the gateway aside until the next acquisition. But our plan ran into opposition from the network group, which is responsible for the day-to-day management and configuration of our firewalls.

The network team currently manages Cisco Pix firewalls with Mountain View, Calif.-based Solsoft Inc.'s centralized management software, Solsoft NP, and they were uncomfortable introducing another firewall product — especially if they had to manage it. Doing so would mean additional training, familiarity with the product, support issues and extensive lab testing, the team complained. Like other departments within our company, the network group is already spread thin.

I explained that Solsoft NP may be able to manage the Symantec appliance's firewall component. This would mean that the network team wouldn't need to be intimate with the syntax or configuration of the access lists for the gateway device.

But they stood firm: They absolutely didn't want to manage any aspect of the firewall portion of the Symantec gateway. Instead, they suggested, why not use some of the extra Pix products they had lying around? These could work as an interim solution. But we'd still need the Symantec appliance for the other security functions.

We may end up not using the firewall portion of the Symantec product. But at this point, we'll get an evaluation unit in. Once we start lab testing, we'll have a better understanding of just how difficult the administration of the firewall is before making a final decision.

WHAT DO YOU THINK?

This week's journal is written by a real security manager, "Mathias Thurman," whose name and employer have been disguised for obvious reasons. Contact him at mathias_thurman@yahoo.com, or join the discussion in our forum:

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I use netForensics' event correlation and risk assessment tool to collect security-related data from our intrusion-detection systems, network switches, routers and firewalls. Recently we upgraded to Version 3, which gives the netForensics graphical user interface a face-lift (see photo). The initial setup was quite lengthy, and it still takes some time to tweak the installation for maximum effectiveness. Nonetheless, the new Security Information Management desktop is more intuitive and easier to use than the previous one.

– Mathias Thurman

SonicWall Firewall Debuts

SonicWall Inc. announced SOHO TZW, a combined firewall and IPsec virtual private network security appliance that supports both wired and 802.11b wireless clients. According to the Sunnyvale, Calif.-based vendor, the basic system, which supports 25 users, sells for $895.

Sun, Symantec Launch Appliance

Sun Microsystems Inc. and Symantec Corp. are releasing a "no-hassles" IDS appliance. The iForce IDS Appliance is a 1U (one U equals 1.75 in.) rack-mounted appliance based on Sun's LX50 Solaris server and Symantec's ManHunt intrusion-detection software. The appliance, which ships this month, costs $21,995.

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BRIEFS

Enterasys Switch Line Announced

Andover, Mass.-based Enterasys Networks Inc. announced last week the Matrix N-Series line of switches for enterprise customers. The Matrix N3 and Matrix N7 switches have the ability to reach 1.68Tbit/sec. throughput and will begin shipping in May. Pricing wasn't disclosed.

SGI Launches Midrange Servers

Silicon Graphics Inc. in Mountain View, Calif., unveiled its new Origin 350 midrange technical server series. The modular, rack-mounted servers include global shared-memory architecture and can be equipped with two to 32 CPUs and up to 64GB of memory. An entry-level configuration with two CPUs and 1GB of memory sells for $23,790. The Origin 350 series is available now.

Opera Adds Web Navigation Tools

Version 7.10 of the Opera for Windows Web browser and the beta version of Opera 7.10 for Linux feature fast-forward and rewind functions. Oslo-based Opera Software ASA said they are the first browsers with buttons for speeding up Web navigation. The browsers can be downloaded for free at *www.opera.com*, or banner-free versions can be purchased starting at $39.

QLogic Rolls Out Multiport Switch

QLogic Corp. in Aliso Viejo, Calif., announced a new high-port-count Fibre Channel edge switch with 4Gbit/sec. throughput. The SANbox2-64 is aimed at the storage network middle ground between bladed directors and fixed-port edge switches. The scalable, modular bladed switch can be equipped with eight to 64 Fibre Channel ports and costs $1,000 per port.

ROBERT L. MITCHELL

IT Pulls a Hat Trick

MOST IT PROFESSIONALS are used to the idea of wearing many hats, as tight budgets and lean staffing have forced them to take on more than one role within their departments. Now, technology changes are blurring the roles between IT and external groups as well.

ROBERT L. MITCHELL is *Computerworld*'s technology evaluations editor. Contact him at robert_mitchell@computerworld.com.

A broad, cross-industry convergence on a single set of communications technologies is becoming the new common denominator across what were formerly disparate corporate job functions. Mass adoption of TCP/IP and Ethernet across disciplines could soon begin to erode departmental barriers and redefine what is and is not an IT function. Turf wars are likely to erupt. And before it's over, IT managers may feel as though they've tried on more hats than the Village People.

The question is, as everything converges onto a common network architecture, how should that architecture be designed, how should it be managed, and who should have responsibility for the disparate systems that use it?

Consider building-automation systems. From heating and ventilation to surveillance and elevator monitoring, building automation will undergo a major transition to TCP/IP and Ethernet over the next 10 years. Traditional use of expensive, proprietary cabling systems, communications protocols and specialized converter boxes will give way to a common, structured cable plant and network infrastructure. The convergence of automated building-monitoring and control systems onto a single communications medium has implications that even those in the industry have yet to fully grasp. New applications are likely to emerge that will offer unprecedented integration — as soon as someone thinks of them.

And with the ratification this summer of the emerging Power-over-Ethernet standard, the local wiring closet will gradually evolve into a universal distribution system for low-power devices, ranging from security-card readers to IP surveillance cameras and even emergency backup lighting, time-card readers and wall clocks. Each will be remotely configurable and will feed back status information over Ethernet.

But with Ethernet fully democratized, who will control the infrastructure? You could create parallel, separately managed networks. But IT has more experience managing IP-based data networks, and sooner or later, someone is going to want to cross the IT and building-automation systems' data streams. For example, analysts say IT security is likely to merge with building-security systems over the next few years in order to provide a more comprehensive security picture.

Meanwhile, wireless LANs are following PDAs through the corporate back door, and departmental managers have begun acting like network managers, installing WLAN access points in a grass-roots effort to give mobile office workers access to the corporate LAN. Do you issue cease-and-desist orders and hope for the best, or do you take charge, set WLAN policy and begin your own deployment? Doing the latter means managing data over radio waves in an unlicensed spectrum that spills over business boundaries, is prone to security problems and doesn't like the office microwave.

WLANs also present a new learning curve in how to manage and troubleshoot a network that uses airwaves as its communications medium. Greg Murphy, president of WLAN management software vendor AirWave Wireless Inc., says a hospital's IT team called recently when WLAN performance began dropping off at regular intervals. AirWave traced the problem to a balloon vendor. With each delivery, the metallic-covered Mylar balloons floated upward, blocking an access point in the lobby.

WLANs clearly need to be managed by IT. Once IT assumes control, however, users will expect the same level of service they get on the wired network. Early management products can help by providing centralized configuration management and performance monitoring, but they also must be integrated with existing enterprise network management systems for end-to-end troubleshooting.

The voice/data divide is another departmental boundary that's falling fast. IP telephony is turning the Ethernet LAN into a giant telephone switch, with IP phones plugged into Ethernet jacks and traditional PBX functions like call management and voice mail running on network servers. As if that wasn't enough, WLAN IP phones are on the way.

In taking on traditional telecommunications department functions, IT must serve a constituency that has high expectations for signal quality, uptime and sophisticated feature sets. Suddenly, data networking staff need to understand the impact of issues like jitter, latency and packet prioritization, while the telecommunications folks bone up on TCP/IP. Do you merge these groups — or somehow move the boundary between them?

How such issues get resolved is likely to redefine IT's role in the organization. As an IT manager, you should take the initiative to drive that process before some other group does it for you.

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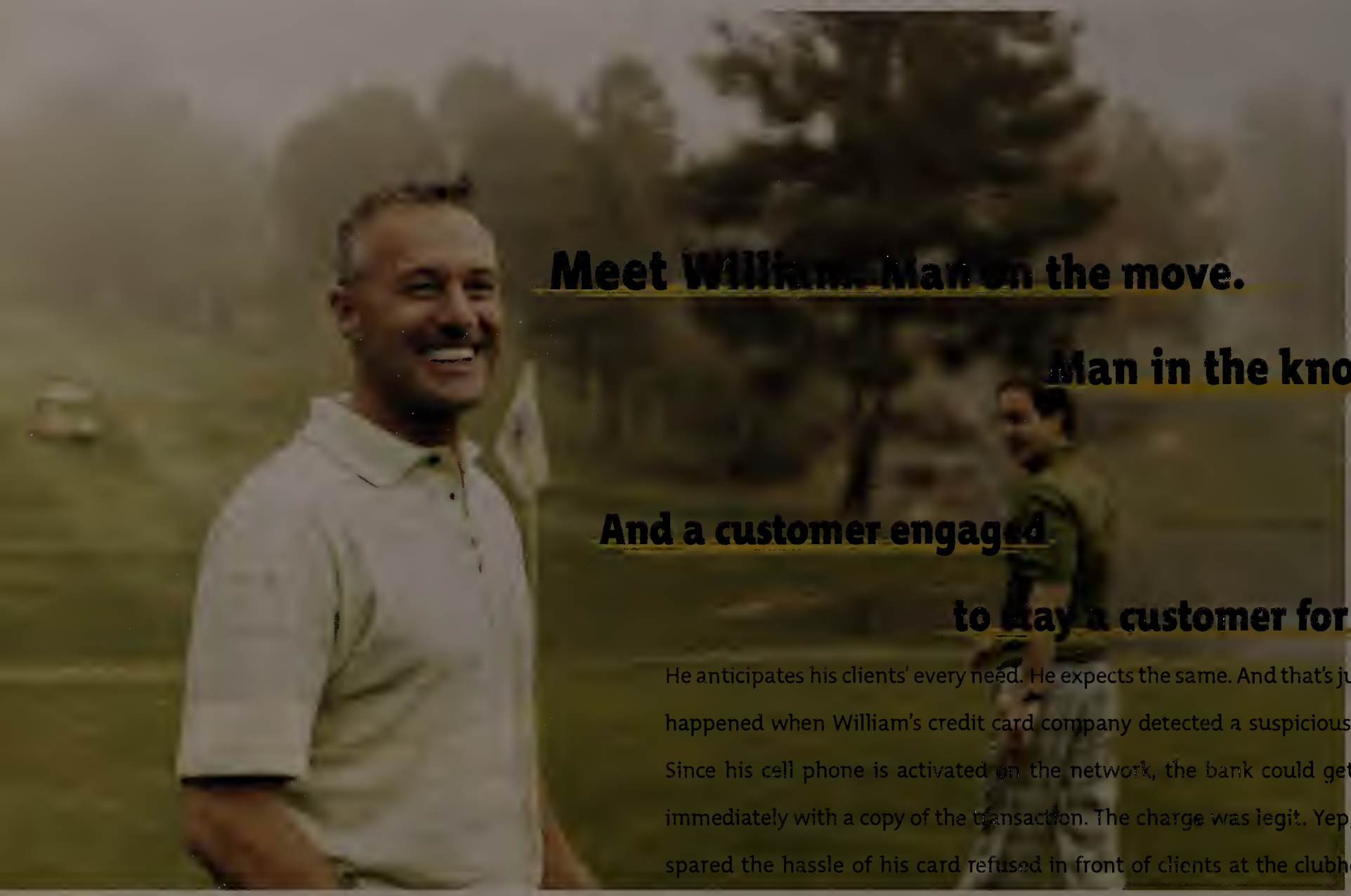

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STEAL THIS IDEA

And the Winner Is . . .

Southern California Edison CIO Mahvash Yazdi says the utility has launched an awards program to recognize IT excellence beyond the walls of the IT department. **Page 44**

Q&A

E-Business So Far

In their new book on e-business, two authors from the Wharton School analyze why some Internet ventures were profitable while others failed. **Page 46**

OPINION

Magna Cum Unemployed

With companies like Microsoft and GE setting up IT shops overseas and the economy slowing, IT professionals are watching job opportunities fade away, writes columnist Donald Finley. **Page 48**

IT WORKFORCE OUTLOOK

THE WRITING IS ON THE WALL. If you are a programmer or an application developer, or work on the IT help desk or in data center operations, your IT job is in jeopardy, and here's why.

In an unrelenting push to lower IT costs, more and more companies are tapping cheaper offshore labor to handle routine tasks such as application maintenance and help desk support functions. Even companies that farm out IT work under pay-as-you-go and other hosted computing models to U.S. outsourcers — such as IBM and Hewlett-Packard Co. — are contributing to the loss of jobs, because these domestic service providers are also shipping IT work abroad. IBM Global Services, for example, is India's fifth-largest employer.

By 2015, 3.3 million white-collar jobs — 472,632 of them in IT and mathematics — and $136 billion in wages are expected to move offshore to countries like Russia, India, China and the Philippines, according to a November 2002 report by Forrester Research Inc. analyst John C. McCarthy.

In March, 212,000 U.S. computer and mathematical professionals were unemployed, according to the U.S. Bureau of Labor Statistics. Looking ahead, Meta Group Inc. analyst Maria Schafer predicts that up to 50% of U.S. IT employees could shift to contract work by 2007, as outsourcing in all forms continues

Continued on page 40

ISABELLE CARDINAL

Exporting IT JOBS

Yours could very well be the next one to go offshore.

By Thomas Hoffman and Patrick Thibodeau

Exporting IT JOBS

Continued from page 39

to increase and as more salaried U.S. IT employees opt to work as contractors to take advantage of the flexible schedules and the opportunity to work on a variety of projects.

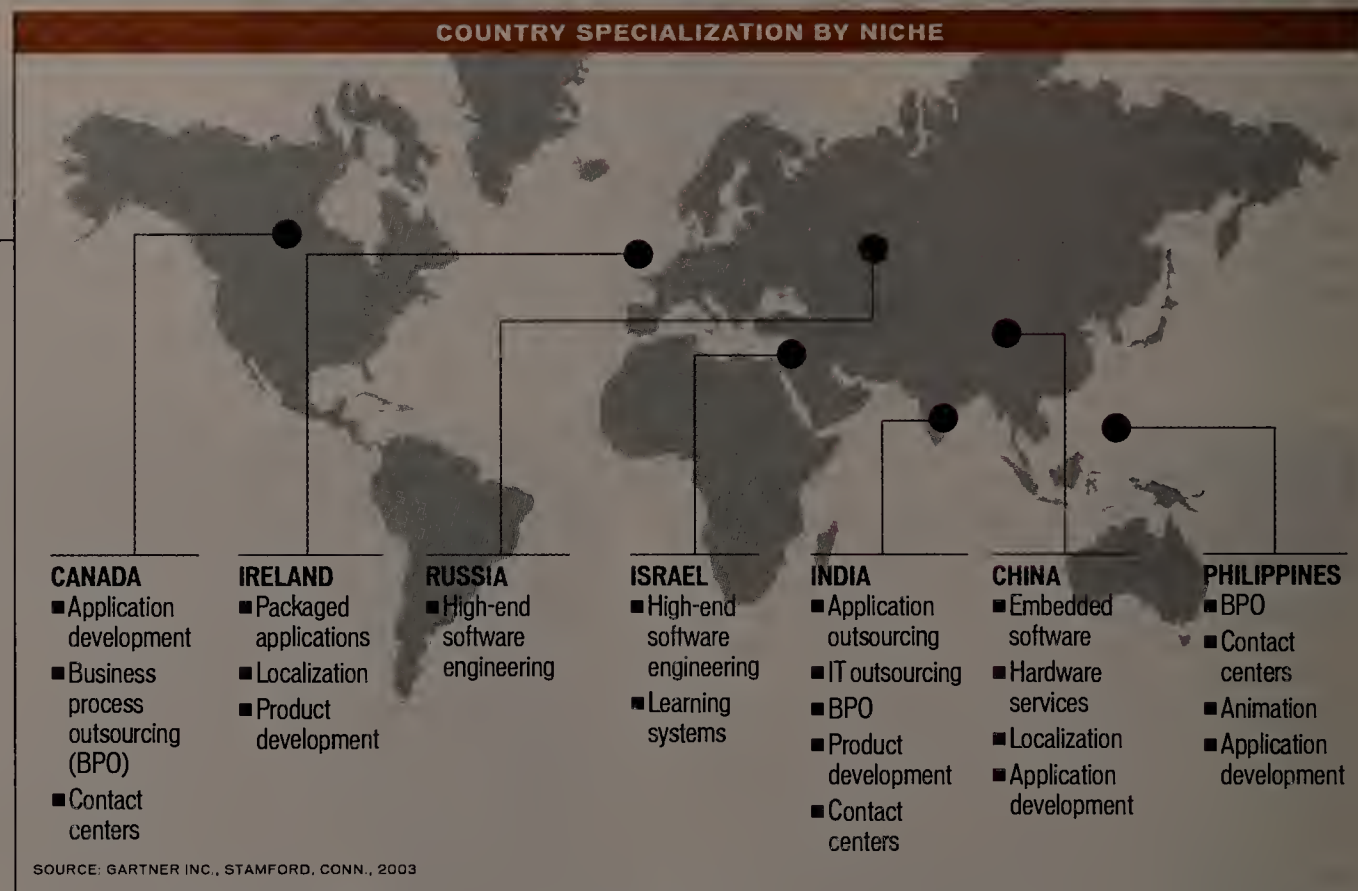
Some industry experts draw an analogy between the thousands of U.S. manufacturing jobs that were sent overseas 20 to 30 years ago and the impact that offshore outsourcing is now having on U.S. IT jobs. Still, there are subtle but important differences between the two. Among them is that the forces behind the shrinking IT workforce go beyond companies seeking lower costs. IT managers are also struggling to strike a balance between the skills they want to have in-house on salary and the talent they can contract for on an as-needed basis.

"It's not just about low cost. CIOs are interested in specialization and reliability," says Mark Hauser, CEO of Cap Gemini Ernst & Young's Americas division. Going forward, CIOs say they want a different mix of skills. They want their salaried IT employees to include experienced project managers and business/IT liaisons who can effectively communicate and broker IT project requirements between business units and IT departments.

Packaged Software Improving

Another factor contributing to IT job loss in the U.S. is companies' growing preference for a buy-vs.-build approach to software development. Purchasing software means that fewer in-house programmers and developers are required than when systems are created from scratch — even when a fair amount of customization is done to the off-the-shelf software. Sophisticated software development techniques and improved global bandwidth and communications are making it possible for companies to have various pieces of development or integration projects conducted in India or China, with the final assembly completed in the U.S. That's why there will continue to be demand for superdevelopers and top-notch integration experts who are adept at managing and coordinating different phases of a development project and pulling together the various components into a cohesive package.

"If you buy the argument that a lot of IT has become commoditized, [then] we are becoming inventors, creators, integrators and architects, and we are going to send the production offshore," says Steve Andriole, a senior consultant at Arlington, Mass.-based Cutter Consortium and an MIS professor at Villanova University in Villanova, Pa. Under this scenario, argues Andriole, U.S. IT organizations will continue to partner with business units to conceptualize IT approaches to business challenges and execute on those projects domestically — even if part of the project development itself is conducted overseas.



The New IT Worker: Angry and Proactive

WHEN IT SPECIALIST JIM MANGI decided to help form a union at IBM in 1999 after the company changed its pension plan, the worst part was telling his father, a Big Blue retiree. "What's he going to think? What's he going to say to his son . . . who is going to start union organizing?" Mangi recalls. But as it turned out, his father was all for it. "He knows it's just not what it was," says Mangi, secretary of Alliance@IBM, which is affiliated with the Communications Workers of America (CWA).

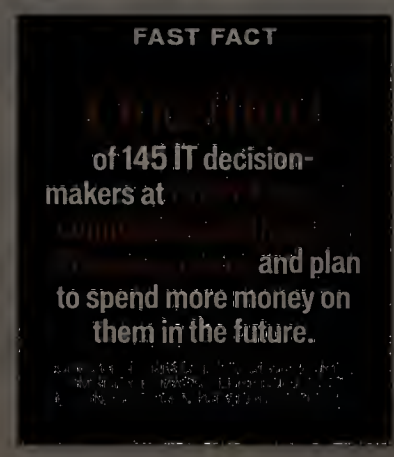
Many high-tech workers are feeling under siege, and Mangi is among those who are fighting back. Job losses from the dot-com bust, benefits cutbacks, offshore development and foreign workers brought in on H-1B visas are fueling activism, lobbying and education efforts.

Much of what union organizers do is educate IT workers, who largely remain reluctant to join unions. Indeed, the CWA, which represents about 700,000 workers in technical areas, estimates that only about 5,000 of its members are in IT.

Mangi lets employees know when IBM is hiring H-1B visa holders by posting on a Web site copies of the federal form that employers must file when hiring workers from overseas. He says he does it to make people aware that even though IBM may be going through layoffs in the U.S., the company may also be applying to hire foreign laborers.

"It's a turning point in this industry," says Marcus Courtney, president of the Seattle-based Washington Alliance of Technology Workers, a high-tech workers' union that's also affiliated with the CWA. Offshore outsourcing and increased use of foreign workers are practices that were inconceivable in the 1990s, he says.

"To sell this workforce out after they helped create one of the most successful economies in the world – that should not be an agenda that workers need to embrace," Courtney adds.



A legislative offensive is beginning to build at the state level. A bill pending in the Washington Statehouse would require employers to give employees at least 60 days notice of a layoff of 50 or more employees. And a New Jersey lawmaker wants state contracts to prohibit offshore work.

The offshore trend can be compared to the overseas job exodus in manufacturing. The loss of relatively well-paying, blue-collar jobs hurt that segment of the workforce, and real wages for the bottom 25% of the workforce never recovered, says Josh Bivens, an economist at the Economic Policy Institute in Washington.

Dave Cooper, former CIO at Lawrence Livermore National Laboratory, a U.S. nuclear weapons lab, says the social costs of offshore development will exceed the corporate bottom-line benefits. Offshore work will discourage young people from studying IT in college, Cooper argues. What has "kept this country strong, both financially and physically, is the fact that we have been able to devel-

Surviving Offshore Cutbacks

JIM HONERKAMP, CIO AT CLOPAY CORP., a building products maker in Mason, Ohio, is one of the people shaping the future of the American IT workforce.

By shipping some of the company's IT programming and application development work to India, Honerkamp has reduced Clopay's IT staff from 90 people, including consultants, to 35. He has no regrets about this decision. Outsourcing many IT functions has kept his budget stable and allowed him to add services. The decision to outsource network management, for instance, let him add network monitoring and other services for the same price.

Outsourcing is a necessity, Honerkamp says. "You really don't have much choice. I don't see how we can justify $90 to $130 an hour," when offshore services charge a third of those hourly rates. "I think the generic programmer [in the U.S.] is really threatened by this," he says.

Indeed, the U.S. IT jobs most adversely affected by offshore outsourcing are programming-related. IT professionals involved in integration work on business-process projects or those who have new technology skills have the best chance of surviving.

The U.S IT professionals who are most in demand often have specific industry or software package skills, such as those used in health care or SAP and PeopleSoft systems, said Russ Tessman, a manager at Vermillion Group/MRI, an IT recruiting company in Des Moines, Iowa. But professionals with general skills such as Java development and Visual Basic programming – "those are the guys really struggling to find new opportunities," he says.

There's also a need for qualified project managers, especially people who know how to bring projects in on time, notes Marty Clague, president and CEO of Farmington Hills, Mich.-based Covansys Corp., which provides offshore IT services in India. IT workers with communications technology and networking skills are also needed in the U.S., according to Clague. There aren't enough people who understand networks, how to run them, build them and protect them, he says.

CIO JIM HONERKAMP says outsourcing is a necessity at Clopay.

But this career advice is based on the kinds of services being provided offshore today, not tomorrow. The future for U.S. IT professionals may get worse.

Advanced networking and storage technologies are working to turn IT into a utility, something that can be managed anywhere, anyplace, says Andre Mendes, chief technology integration officer at Public Broadcasting Service in Alexandria, Va.

"The truth is that as we continue to progress, the cost of providing a secure environment for a company is going to be too large," says Mendes. "There are going to be too many variables, too many unknowns, and at what point do you say, 'No, I want a company that does this for a living to worry about these things on a 24/7 basis.' "

With backbone networks operating at almost zero latency worldwide, there's nothing to stop the heart of a corporate IT department – its data center – from being moved offshore, Mendes says. "If communication links are not only ubiquitous but extremely reliable, then what difference does it make if it's down the block or around the country?"

– Patrick Thibodeau and Thomas Hoffman

To that end, more than a dozen CIOs at Fortune 1,000 companies and many other IT leaders at large IT organizations who were interviewed for this report say the IT worker they're looking for is someone who combines business savvy and broad technology acumen.

"We're trying to preserve the internal knowledge that's important to the business while leveraging lower labor rates and technological sophistication in different geographies," says Harriet Edelman, senior vice president and CIO at Avon Products Inc. in New York. The $6 billion beauty products company is in the early stages of creating its own network of regional development centers. It began by establishing a Web development hub in Hungary last year [QuickLink 37761].

Global Exchange Services Inc. (GXS), a Gaithersburg, Md.-based spin-off of General Electric Co. that provides transaction management services to more than 60,000 retailers worldwide, pays about $30 per hour for programming work in its company-operated offshore centers in India and the Philippines [QuickLink 37522]. In the U.S., GXS's total hourly programmer cost is $110 to $120.

The economics give companies little choice but to export programming work, especially for software maintenance and support. But increasingly, they're also exporting application development and infrastructure support work, says Rita Terdiman, an analyst at Stamford, Conn.-based Gartner Inc.

"You have to do it, otherwise the competition is doing it for you," said Tasos Tsolakis, GXS vice president of global technology.

Workers Find Comfort in Groups

On the IT employee side, the offshore movement is changing workers' attitudes toward their employers. To protect their livelihoods, programmers and others are embracing strategies more common among blue-collar workers. These include joining unions and lobbying legislators. "Every day you go to work, you don't know if you are going to have a job that day," says Linda Guyer, president of Alliance@IBM, an Endicott, N.Y.-based union of roughly 5,000 IBM workers. "You don't know whether you are going to be required to train your replacement" from India (see "The New IT Worker: Angry and Proactive").

The union was formed in 1999, when IBM made unpopular changes to workers' pension plans. Today, the union continues to play mostly an educational and informational role. For example, it lets employees know when IBM is hiring H-1B visa holders by posting on a Web site copies of the federal form that employers must file when hiring overseas workers.

Even though it has no bargaining rights, the union says it can still exert pressure as a voice of influence. "We're small, but we think we carry a lot of weight. The executives are aware we exist, and I think we are a very effective pressure point," Guyer says.

Some IT executives say they have no choice but to outsource. Sue Unger, senior vice president and CIO at DaimlerChrysler AG, says her company last year began to outsource maintenance for 150 core applica-

■ Many CIOs will investigate or pursue IT offshore outsourcing this year for three reasons: cost savings, access to specific skills and a general sentiment that internal staff can't be trained quickly or effectively in new skills.

■ IT and business leaders who outsource development, support and services must redirect their employees to critical roles such as leadership, architecture, business analysis, business enhancement, project management and vendor management.

■ Discontinuity in IT jobs, skills and support roles will create upheavals in compensation, rewards and incentives at some companies. The ones that move cautiously and respectfully will keep performance high and defuse employee anger.

SOURCE: GARTNER INC.

op these technologies and lead the rest of the world," he says. "If we no longer have U.S. citizens who are willing to [study IT in college], it's going to hurt us socially in an economic sense."

But Steve Andriole, a senior consultant at Cutter Consortium, and an MIS professor at Villanova University, says the U.S. will still be the place where technology ideas are born. "I think the risks are lower that we will lose our core competencies," he says. And that has to do with the volatility and rapid pace of change of technology, which sees new developments every two to three years, vs. 10 to 15 years in manufacturing.

"Technological innovation is still largely U.S.-centric," he says. "In manufacturing, it's not."

– Patrick Thibodeau and Thomas Hoffman

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Exporting IT JOBS

Continued from page 41

tions that support its engineering, manufacturing and sales activities to Infosys Technologies Ltd. and Syntel Inc., both in India. The move allowed DaimlerChrysler to cut loose high-priced U.S.-based consultants who were used for strategic projects and replace them with 100 DaimlerChrysler IT staffers and on-site contractors who had been doing maintenance work.

"Companies are in a death spiral if you try to do everything inside," says Unger.

William Belding is a beneficiary of that transition. Belding joined DaimlerChrysler in 1996 as a client/server programmer/analyst. He focused on quality reporting for the automaker's data warehouse. Since those tasks were sent to India last year, Belding has taken on responsibility for the security infrastructure of the company's Web-based Dealer Connect portal.

"It's a good opportunity for me to see something new, to extend my career in the right direction," says Belding.

But if the previous century's outsourcing of U.S. manufacturing jobs is any barometer, many more displaced IT workers may have to settle for less. Blue-collar manufacturing workers who lost their jobs typically faced a lower standard of living, and the same fate could face programmers and others, says Josh Bivens, an economist at the Economic Policy Institute in Washington. High-tech outsourcing isn't on the same scale as manufacturing's, "but it has a familiar feel to it," he says.

James Pace, a Connecticut IT mainframe consultant who had been working at an insurance company, lost his job in January. He says he believes it was a result of offshore outsourcing. Pace says IT workers affected by offshore outsourcing are taking lower-paying jobs, such as restaurant managers and police officers, and that decreases their spending power. "Everything is a trickle-down effect," says Pace.

INTERNATIONAL BACKLASH

U.S. and European government officials are considering proposals that would slow down the growth of offshore outsourcing:

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SALARY COMPARISON

A look at programmers' annual salaries in various countries illustrates **why offshore outsourcing is becoming popular** *among companies trying to cut costs. The average salary for a systems programmer in the U.S. is $63,331.*

[illegible] and Hungary	$4,800 to $8,000
India	$5,880
[illegible]	$6,564
Malaysia	$7,200
Russian Federation	$5,000 to $7,500
[illegible]	$8,952
[illegible]	$28,174
[illegible]	$23,000 to $34,000
[illegible]	$15,000 to $38,000

SOURCE CIO MAGAZINE, NOVEMBER 2002

NOTE: Base annual salaries in U.S. dollars

There's More to Consider Than Cheaper Labor

THERE'S MUCH MORE TO OFFSHORE OUTSOURCING than lower labor rates. Industry experts and CIOs with offshore experience caution would-be customers to carefully examine all of the risks, including the hidden costs. It's also important to protect intellectual property, examine the geopolitical risks in the region where the work will be done and effectively communicate the company's overall outsourcing strategy to stateside workers.

Offshore outsourcing "creates some stressful situations, some motivational factors and some confidence factors with your own people," says Rick Greenwood, CIO at GMAC-RFC Residential Capital Group in Minneapolis. Greenwood addresses those issues, in part, by keeping his company's most important IT work in the U.S.

"We're very careful not to give away what I would say is a core competency and core business knowledge," he says. Instead, he and other IT managers at the company try to maintain those competencies by providing IT staffers in the U.S. with continual training and moving them to high-impact projects.

FAST FACT

India
is graduating roughly **75,000** IT professionals annually, vs. **26,000** in the U.S.

SOURCE NATIONAL ASSOCIATION OF SOFTWARE AND SERVICE COMPANIES NEW DELHI INDIA

Scrutinize Political Risks

Companies that exclusively outsource to a third party in a single country run the risk that a political situation, such as armed conflict between Pakistan and India, could shut down offshore IT operations. That's an important consideration for Delta Air Lines Inc., which wants offshore work scattered in wider areas.

"We're trying to manage the risk of the political environment," says Curtis Robb, president and CEO of Delta Technology Inc., the IT services arm of the Atlanta-based airline. The company has awarded IBM a contract to provide offshore IT services because IBM has 16 regional centers worldwide.

More than 90% of outsourced application maintenance, help desk and desktop maintenance work and a limited amount of call center and customer service work is currently being sent to India, according to Avinash Vashistha, a senior adviser at NeoIT, a San Ramon, Calif.-based offshore services advisory firm. That figure excludes IT work outsourced to Ireland and Canada but includes other countries such as Israel, says Vashistha.

Experts say outsourcing to India can reduce IT labor costs by up to 50%, but most customers underestimate the indirect project and program management costs.

"When you send your people overseas to visit these sites frequently, your costs go from $42 an hour to $85 an hour," says Steve Andriole, a senior consultant at Arlington, Mass.-based Cutter Consortium and a professor of MIS at Villanova University. Andriole's calculation includes travel costs plus the cost of lost productivity that occurs when a U.S. IT worker is removed from his daily tasks and sent overseas for a few weeks.

Those costs can go even higher when project requirements "creep" or if a development problem emerges at an offshore programming house, says Andriole. "If you have to drop in 10 people from the states, and they spend a month or two there, guess what? You've just erased most of your cost savings."

Another risk of moving IT work offshore is the potential loss of intellectual property and business-process secrets. Some IT managers worry that offshore outsourcers will copy and sell that knowledge or repackage it and present it to a competitor.

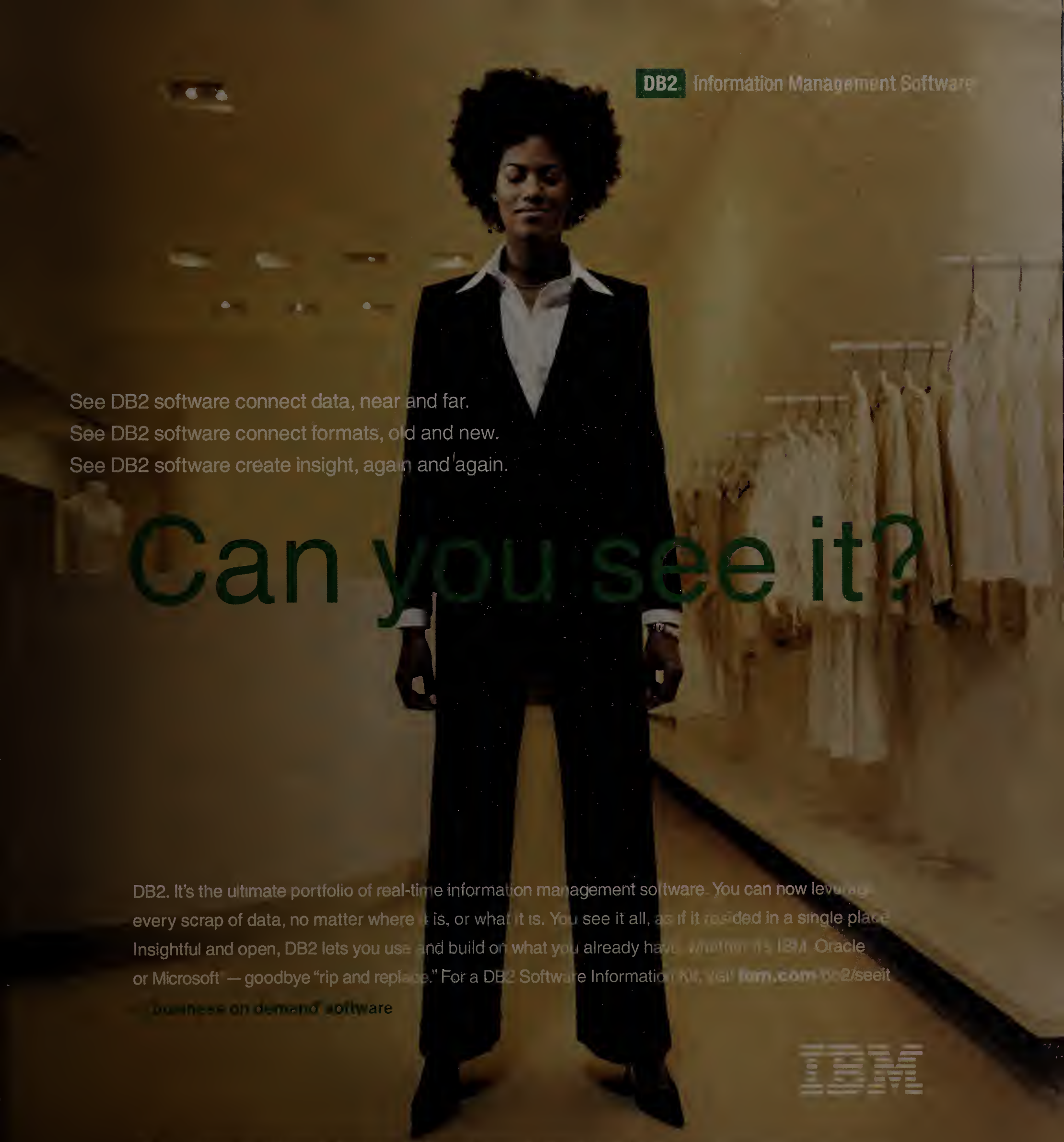
"If we send development of too much of our core business out of our control, what happens to that when our competitor goes to the same third party and says, 'We want to do what they did?' " says Richard Nolle, vice president of systems at Reinsurance Group of America Inc. in Chesterfield, Mo. "The economics is driving me to it [outsourcing], but those kinds of concerns are making me cautious," adds Nolle, whose company already sends application development work overseas.

One way to avoid these problems is "by trying to break up key pieces" of work being sent offshore so "no one can easily assemble those pieces," says Dennis Roell, IT manager at Betts USA Inc. in Florence, Ky., which makes packaging products such as toothpaste tubes. "Think of it as encryption — you want to reassemble the message," says Roell.

— Thomas Hoffman and Patrick Thibodeau

"We're trying to manage the risk of the political environment."

CURTIS ROBB, president and CEO, Delta Technology



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And the Winner Is...

An IT awards program fosters collaboration between business and IT.

By Melissa Solomon

KATHY FONG KNOWS NUMBERS. As a certified public accountant, it's her job. But technology? She's no rookie, but no expert, either. So when she received Southern California Edison's (SCE) first-ever CIO Excellence in IT Award, she was simultaneously flattered and taken aback.

It was no mistake. Fong was one of 10 employees — including three from outside IT — to receive the new annual award in March from Mahvash Yazdi, CIO at the Rosemead, Calif.-based energy utility. "What's unique about our program is we decided to take it to a new level and recognize and award our internal clients," says Yazdi.

Honoring business unit employees with IT awards may seem counterintuitive, but Yazdi says it helps promote the value of IT/business partnerships companywide.

STEAL THIS IDEA

Such awards aren't something that Sue Goldberg has seen. But the president of Northeast Training Group Inc., an IT training consulting company in Chestnut Hill, Mass., says they're a great way to promote collaboration by shining a light on those who live it.

"It's almost like an Academy Award," Fong says. "It's probably the closest I'll ever get to that."

How It Works

The names of the award categories — Commit and Deliver, Operational Excellence and Innovation, and Technical Literacy — reflect the core strategies and principles of SCE's IT department. Yazdi's team wanted to choose role models who demonstrate day-to-day actions in line with those principles.

Fong has spent the past year and a half leading a cross-functional project team that's integrating systems across various business units so that meter readings, billing and ledgers, for instance, are tied together into a whole system rather than operated as independent silos.

DAVID STRICK

■ **WHO:** Mahvash Yazdi, CIO at Southern California Edison and Edison International, Rosemead, Calif.

■ **CHALLENGE:** To instill IT values and strategies into the day-to-day activities of workers throughout the energy utility company.

■ **SOLUTION:** CIO Excellence in IT Awards, which recognize IT and non-IT employees.

John Ballance, director of transmission and distribution engineering, won the Innovation award for teaming with IT to implement an Internet-based training system that veteran engineers can use to conduct lectures for junior engineers scattered around the state.

It was wonderful to be honored by the IT department, Ballance says, but recognizing IT employees is just as critical. "A large part of the company interacts with those people," he says. "So you start putting faces to names of people who are doing extraordinary jobs."

Paul Killins, winner of the Commit and Deliver award, is one of those IT people, says Yazdi. When SCE learned it had to take over energy procurement from the state by Jan. 1, Killins, SCE's IT energy procurement manager, led a team to get a combined procurement and risk management system in fast. The system and the business processes supporting it had to be able to manage SCE's portfolio of power-generation assets, its long-term energy contracts from outside companies and its spot-market options to determine the best source of energy at any given time. The team conducted a warp-speed market study, hammered out a contract to purchase Nucleus energy-trading software from New York-based Caminus Corp. (since acquired by SunGard Data Systems Inc.) and teamed with Caminus staff and consultants from London-based PA Consulting Group to customize and install the software.

At the heart of the system is a client/server application with a robust infrastructure on which to run the systems: Windows 2000 servers and an IBM Regatta cluster on an Oracle database.

What could have been a yearlong project took four months. "It was the most challenging project I've worked on in my entire life," says Killins.

Rolling Out Your Own

If you create an IT award program, spend a lot of time spreading the word so enough nominations come in, advises Mariette Keshishian, manager of training and communication for IT at SCE. The company's newsletter, cross-functional management meetings, e-mail and its intranet all helped get the word out, says Mary Fitzpatrick, manager of IT communications at SCE.

Fitzpatrick also suggests that awards committees put careful thought into who gets recognized and in what way. For instance, would finalists be embarrassed by being publicly named, since they didn't win? And what's an appropriate prize for the winners? SCE asked the finalists' managers to recognize them within their units, and the winners received $1,500 in cash, a crystal desktop award and companywide recognition, says Fitzpatrick.

But the user-award piece isn't for everyone, says Keshishian. If it seems forced, it won't work. If you have a poor relationship with your users, an award isn't going to magically make things better. You need to have a good relationship first, and then the award will seem genuine. ◗

Solomon is a freelance journalist in New York. Contact her at melissasolomon7@hotmail.com.

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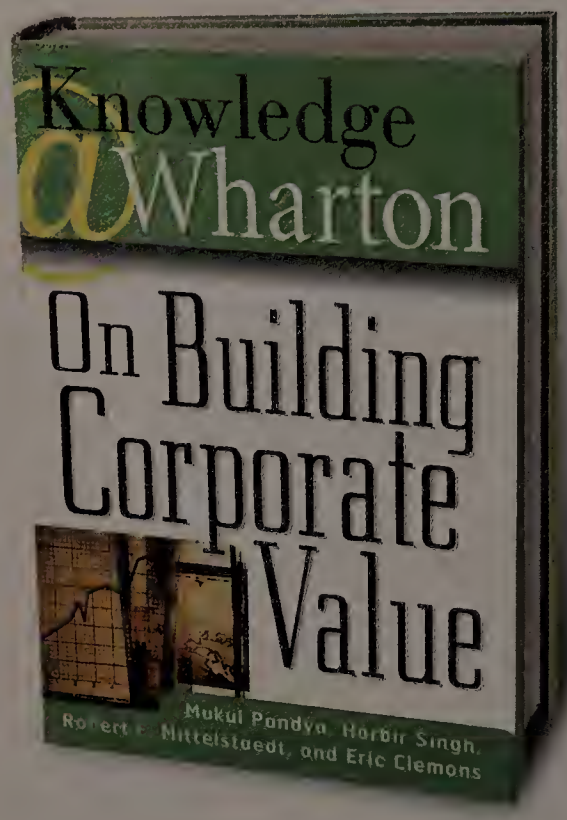
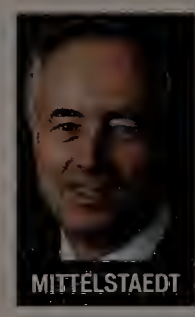


In 1999, the Wharton School of the University of Pennsylvania launched Knowledge@Wharton (http://knowledge.wharton.upenn.edu)*, an online research and business analysis journal designed to go head-to-head with the* Harvard Business Review *by offering business insights and research.*

Now, **Robert E. Mittelstaedt**, *vice dean and director of the Aresty Institute of Executive Education at the Wharton School, and* **Mukul Pandya**, *editor of* Knowledge@Wharton, *have written a book.* Knowledge@Wharton: On Building Corporate Value *(John Wiley & Sons Inc., 2003) takes a look at the ups and downs of e-business. They recently spoke with Kathleen Melymuka about the lessons learned so far about Web business strategies.*

So, has the Internet changed everything?
MITTELSTAEDT: It didn't change everything in the way people anticipated, but it did [show] that bricks-and-mortar businesses can differentiate themselves if they really learn to use the Internet — and IT as a whole — because the principles are the same, and the Internet is nothing more than a very easily accessible platform.

In the book, you talk about some important consequences of the Internet. Tell me about the "integration effect."
MITTELSTAEDT: It's the ability to apply 20-year-old IT principles in a ubiquitous fashion so that everybody has access, and you get your customer to do your work for you across a whole spectrum of things.


MITTELSTAEDT

Can you give an example?
MITTELSTAEDT: US Airways has given you the ability to print your boarding pass before you leave home and skip all the check-in lines. They haven't changed the fundamental chain of activities, but they've pushed a piece of that work out, and they get the customer to do it for them. The technology has integrated the work in a different way: diffused it.

How does the Internet add value to an organization?
PANDYA: *Knowledge@Wharton* itself is an example. It has taken academic research, which was primarily distributed through academic journals meant for specialists. Using the Web, we set up a multilayered Web site where you can go from a one-paragraph summary of a research paper, click through to a plain-English article spelling out the implications of that research, click through to a PDF of the paper itself and look at related Web links. The Internet allows you do something that is impossible in print: that is, explore this topic at four different levels of depth. The impact that has in terms of Wharton's ability to relate academic research to management practice is enormous.

PANDYA

Why do companies fail at using the Internet?
MITTELSTAEDT: In the book, we talk about the story of Webvan vs. other online grocers. We predicted Webvan would never work [because] they decided to reinvent the whole system. They started from scratch and ignored the entire infrastructure and in the process took on enormous debt, which there was no way to ever work off in a low-margin business, even with efficiencies from technology. While Webvan was failing and destroying $1.2 billion of capital, a company called Tesco in the U.K. was using their existing infrastructure, using their stores as picking points, putting limits on [deliveries]. And as an incremental activity, it was profitable. It was not profitable as a stand-alone activity in the way Webvan tried to pursue it. The economic model didn't work. So the model matters.

What are some of the other major risks in e-business, and how can companies work against them?
PANDYA: Quite a few of the errors were driven by not looking at the business itself but being swayed by financial considerations, [like] the stock valuations, that spinning out a separate Internet division could bring about. Companies that looked at the business and saw how using the Internet and other forms of IT could enhance the business — those were able to drive more value creation.
MITTELSTAEDT: There were also competitive risks. If what you do is easily imitated, and you don't have anything that locks in your customer in some way, you run the risk of simply being copied and made irrelevant.

Most of what we've been talking about has been business-to-consumer. What's the state of B2B?
MITTELSTAEDT: The name has gone out of fashion, but that's where the bigger impact really is. Wal-Mart has an unbelievable computerized supply chain and inventory management system that goes over the Internet, but the Internet didn't make that happen. The Internet makes it easier and cheaper . . . and for smaller businesses to duplicate functions, [like] automatic ordering, that enable them to compete with bigger companies in some cases.
PANDYA: One area in business-to-business I find fascinating is the way the Internet and IT are making it possible to outsource work across borders. You have companies like Amazon or Dell that have set up customer contact centers in India and Singapore, and these are very often operated by different companies than the parent. This allows you to integrate the operations of a company in the West with a low-cost provider in another country and get the benefit of that cost differential. This has been going on in things like software development, but increasingly . . . it's all kinds of services that require educated people to interact with technology. The term I've heard used for it is "brain arbitrage," because you're moving work to where it can be performed most effectively.

What are the lessons companies should be taking away from the whole e-business experience?
MITTELSTAEDT: You can't violate the laws of economics. And there's no such thing as a sustainable competitive advantage. Technology can give you a temporary advantage while you figure out what the next thing after that is going to be.
PANDYA: The Internet changes a lot, but you have to work pretty hard to discover what it changes, and if you don't recognize that, then you pay the price for it. ◗

Melymuka is a Computerworld *contributing writer. Contact her at kmelymuka@yahoo.com.*

E-Business So Far

Two Wharton School authors talk about winners, losers and brain arbitrage.

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BRIEFS

Financial Outsourcer Creditek Names CIO

Creditek LLC, a leading provider of revenue-cycle business-process outsourcing in Parsippany, N.J., this month appointed Bruce Blair as senior vice president and CIO. Blair will lead Creditek's technology team in managing all internal and external systems, including the development, launch and implementation of advanced client business-intelligence and reporting systems.

Blair was previously president of Iselin, N.J.-based GovXcel, a provider of software used by municipalities to automate back-office functions; CIO at Verticalnet Software LLC, a Malvern, Pa.-based provider of collaborative supply chain software; and a first vice president at Merrill Lynch & Co.

Wireless Revs Up

- Approximately 43% of spending on wireless infrastructure and application services (WIAS) originated in the Americas in 2002. This share will remain fairly consistent, reaching 45% in 2007.
- Communications and media, retail, logistics and health care will embrace WIAS at the fastest rate and with the highest level of expenditures. U.S. industries are expected to spend $25.6 billion by 2007.
- As mobile networks grow in both scope and complexity, opportunities will continue to emerge in consulting, integration and managed services, including the measurement and planning of users' network capacity needs and the design of appropriate networks to meet those needs.
- The worldwide total of available "hot spots," or high-speed wireless LANs, will increase from about 19,000 sites at the end of 2002 to about 118,000 in 2005.
- The worldwide wireless and application services market will increase from $31.1 billion in 2002 to $68.4 billion in 2007.

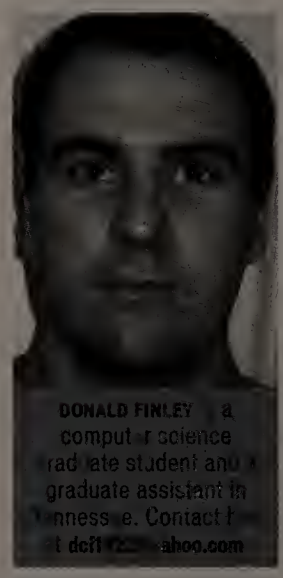
SOURCE: IDC, FRAMINGHAM, MASS.

DONALD FINLEY ■ PEER TO PEERS

Magna Cum Unemployed

WHEN I CHANGED my college major from mechanical engineering to computer science in 1998, I had few reservations about making the switch. After all, the salaries of the two professions were comparable, and IT seemed to be thriving.

Unfortunately, my graduation in December 2000 roughly coincided with the crash of the dot-coms and a dip in the economy, which made job searching much more difficult.



DONALD FINLEY is a computer science graduate student and graduate assistant in business. Contact him at dcfi[illegible]@yahoo.com

No fear, I thought, I have an academic record that will impress employers and help me stand out among job candidates. I had graduated magna cum laude, made the dean's list multiple times, won awards for academic excellence — and no one seemed to care. The liability of my inexperience seemed to outweigh any advantage that a solid academic background provided.

The slowing of the economy has left many experienced IT professionals looking for jobs, and companies have their choice of workers with proven track records. This means decreased opportunities for entry-level programmers with résumés heavy on skills and education and light on job history.

Illustrating this fact are the employers and headhunters who call to express interest in the skills I have listed on my résumé online. One of their first questions is, "How much experience do you have?" Answering this potentially damning question with honesty usually ensures no future correspondence.

The lack of opportunities made me increasingly worried, and in September 2001, I committed an act of desperation. I had been job searching by myself and through employment agencies for almost eight months when I accepted a knowledge management position at a government agency in Washington, where living expenses are high and the pay is low. The job was part intern/part employee and kept me on the periphery of working with IT (checking e-mail was my sole interaction with computers). After six months in the program, I decided to return home and earnestly look for opportunities in software development, the area of most interest to me.

Searching online job sites yielded few possibilities for someone with my level of experience; I fared better by contacting hiring managers directly. After three months of research and many phone calls to managers, I landed a job as a Web developer at a struggling e-learning company. But after being told almost every week for six months that the office might not be open the following week, I was searching for another job by December 2002.

During this time, I had also enrolled in a graduate program, thinking that another degree might help me find a job. However, since starting the program, I have considered the possibility that even this move may not help, because there are factors affecting the job market that are beyond my control.

For instance, the controversial H-1B and L-1 visa programs exacerbate the situation by importing foreign IT workers, placing them in direct competition with American workers for jobs. This, by far, is the most disturbing discovery to me. Abuse of these programs is obvious, and their necessity escapes me.

My heart sinks when I read stories about IT workers such as those at Siemens in Lake Mary, Fla., who were replaced by L-1 visa workers and made to train their replacements. The matter is compounded by the trend of sending IT jobs offshore, as summed up in the ominous proclamation of Ann Livermore, HP's services chief, when she stated, "We're trying to move everything we can offshore," in an interview in a December 2002 *Forbes* article. Taking these things into account, I am convinced that the IT industry is being undermined.

This point was driven home as I sat with the head of the computer science department at my university and we spoke about the scarcity of IT jobs. "I shouldn't be saying this, because I am from India," he said, "but India has really prospered through this." I told him that I was aware of all the outsourcing, but he explained that companies such as Microsoft were going a step further and setting up shop in India. Then he reassured me that creative IT jobs such as research would be safe in the U.S., but he corrected himself midstream by saying that GE was in the process of constructing a research center in India.

Finally, he punctuated his remarks by saying, "It's been a tough three years," an understatement with which I emphatically agree. ◗

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Tyson Integrates IT, Cuts Costs After Merger

BY MARC L. SONGINI

A massive IT consolidation and integration project phase was wrapped up on time and on budget at Tyson Foods Inc., despite its considerable complexity and demanding schedule.

The multimillion-dollar effort involved integrating the IT operations of Springdale, Ark.-based Tyson and 17 independent companies of the Foodbrands America Inc. unit of meatpacking conglomerate IBP Inc. Tyson purchased IBP in September 2001.

FOLLOW-UP

The integration was finished in August, says Tyson's new CIO, Jeri Dunn. In the process, Gary Cooper, the former CIO and head of the project, became chief technology officer. In his new role, Cooper oversees all servers, databases and other IT-related assets for 12,000 end users at the company.

Cooper says that as part of the makeover, Tyson changed its e-mail infrastructure to Microsoft Exchange software, eliminating Lotus Notes seats. It also extended its WorldCom frame-relay network to the IBP network and now runs videoconferences over those lines.

Tyson inherited 19 systems in the merger and has reduced that number to two. The next step is to get rid of one more, says Cooper, noting there are also significantly fewer AS/400 applications running now.

There is still work under way to move the multiple back-end systems, many of them homegrown, to an SAP ERP backbone. SAP software already handles payroll, general ledger, purchasing and accounts-payable functions. Tyson is also rolling out supply chain management software from Manugistics Inc. for its chicken businesses.

Streamlining has reduced head count and maintenance costs. Dunn says this has cut hundreds of thousands of dollars in IT-related costs. "The reductions were not pleasant," she says, but they were necessary.

Tyson is evaluating business processes and IT support to see what areas are unique or add value and can be retained or standardized. It's also planning the consolidation of the fresh meats division of IBP.

Cooper is hesitant to say whether lessons were learned from the project. "We've acquired so many companies and integrated so many systems," he says. "It's a bag of tricks you use, and there are not a lot of 'aha's. It's always hard work." ◗

MEATY INTEGRATION

Read more about Tyson's integration:

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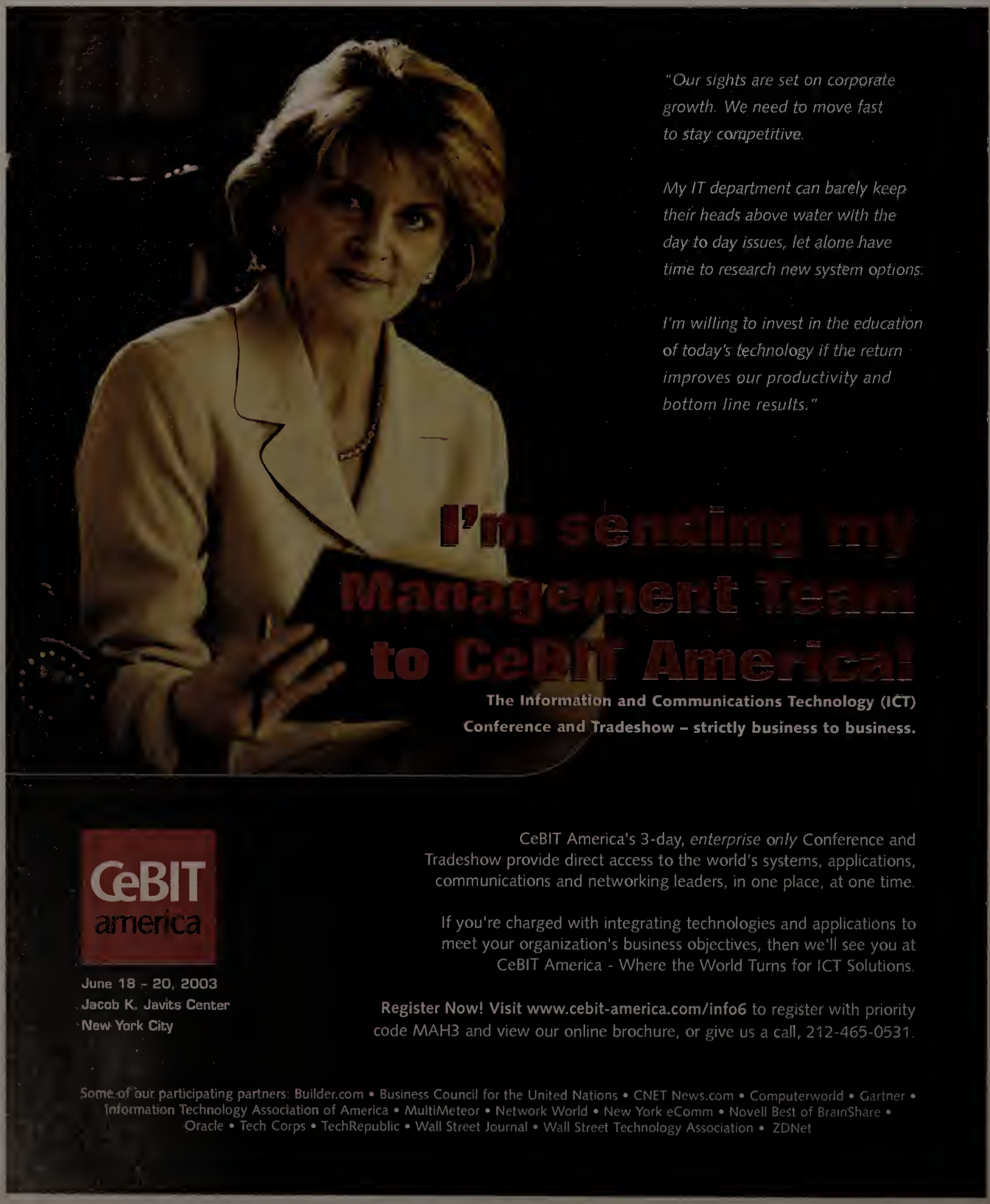

Call for Nominations

Is your organization making the most of technology on the cutting edge? We want to hear about it!

Computerworld's Innovative Technology Awards 2003 will honor the industry's top vendors that are helping their customers achieve business value through technology.

Tell us about your successful technology application and nominate your vendor online at **www.computerworld.com/research/innovativetech**

ABOUT THE AWARDS

For the second year, these customer choice awards will spotlight leading vendors and showcase how their customers are using technology to solve business problems in real-world settings. Nominations from IT customers will be collected from now through May 12, 2003. Nominated vendors will be surveyed about their technology applications. A panel of outside experts and Computerworld editors will review the surveys and choose the winners.

Survey results and stories that offer practical advice from IT leaders using these technologies will be published in the September 22, 2003, issue, as well as online at Computerworld.com.

COMPUTERWORLD
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AWARDS

Need More Information?

Contact InnovativeTech@computerworld.com.
But hurry! The nomination deadline is May 12, 2003.

Advertising Supplement

IT Careers: Industry Drives Online Degree Trends

More than 20,000 people in the United States are finding a new way to quickly morph current skills into emerging job requirements. Colleges and universities are using online coursework to stay in step with rapidly developing technologies, pushing online curriculum that in the past would have taken years to develop. From data mining to infrastructure security and systems networking, the new degree programs are allowing IT professionals to transform with the industry.

These aren't diploma mill programs, either. Universities ranging from Stanford University to Massachusetts Institute of Technology, from Boston University to James Madison University and the University of Missouri-Rolla, are enrolling students for classes conducted via the Internet. "Traditionally, residential universities and colleges have been slower in meeting emerging technology needs," says Vicky Phillips, author of *Best Distance Learning Graduate Schools-Technology 2003*. "We're noticing that schools are choosing to put newer concentrations, such as cyber security, online to be market responsive."

Tanya Zlateva, chairman of the online computer science graduate program at Boston University, says demand for online courses follows the IT industry trends. "We offer a blended program of four face-to-face meetings during the semester and web-based learning," Zlateva says. The university added an IT security focus to its graduate programs this year, and will offer a full concentration IT security program beginning Fall 2003. "It's relatively easy to put material online," she adds. "But by adding streaming video and interaction, access to lab work online and other facets, the program has greater value."

However, online study isn't for everyone, cautions Phillips. Top on the list to consider: your own learning style. If you've taken online, CD-ROM or correspondence courses in the past, you know whether you're up to it. "You need good time management skills and self-motivation," says Phillips. "It's a large psychological factor." Phillips' research indicates retention rates for online students are slightly – though not significantly– lower than those in on-campus programs.

Secondly, look for accreditation by the regional association accrediting schools and colleges for the main campus, as well as any other accreditations, such as those for business, engineering or technology. If the accreditation isn't from a group belonging to the Council for Higher Educatio Accreditation (chea.org), you may want to reconsider. Then find out how much you'll interact with faculty and other students. You may need access to a satellite link-up or to travel to campus. Usually students in an online class interact via bulletin board or through conference calls. The more you interact with students and faculty, the more likel you'll stay in the program.

Financial assistance is another factor. Not all online programs qualify for low-interest student loans, nor do all corporate reimbursement programs apply. Public universities frequently apply in-state tuition/out-of-state tuition rates just as they would for resident students. Some, however, have a single distance-learning tuition structure. In terms c cost, compare overall tuition costs, the value of a national brand name degree, and the cost of access – visits to campus or satellite links, for example.

"We haven't yet seen the peak in enrollment for online degree programs," predicts Phillips. "With learning, once i not enough."

IT Careers

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Exec Search, Inc. a technology-consulting firm has job openings both locally & around the country for Programmer Analysts, Database Administrators, & Software Engineers w/exp in one or more (depending on need) of following skills: WebMethods Integration Server, WebMethods Trading Networks, WebMethods Enterprise Server, IBM MQSeries, IBM Assembler, IBM WebSphere, Mainframes, CICS, DB2, COBOL, Unix, Sun Solaris, Win, C/C++, Visual C++, VB, Power Builder, Dsgnr 2000, Dvlpr 2000, Oracle, Oracle Applic, SQL Server, MS Access, SQL, SQL Plus, PL/SQL, Data warehousing Tools, HTML, DHTML, XML, TCP/IP, Perl, JSP, Weblogic, Java, Java Script, VB Script, ASP, Clarify, Documentum, CoreDossierX, Rational Rose, Testing tools & QA methodologies. Some pos req Bach others Master's in Comp Sci or related field, or its equiv as well as relevant IT exp. Relocation may be necessary depending on particular employment pos. Send resume to Exec Search, Inc., C/O ISS, 1300 Bent Creek Blvd, Ste. 200, Mechanicsburg, PA 17050

Sr. Applications Systems Analyst (Indianapolis, IN) - Design, dev., create, procure, code, test, implement, install & maintain computer software systems. Apply principles & techniques of comp. sci., engg., investigation, planning & analysis, to determine software requirements & feasibility of design w/in time & costs constraints. Handle RenCS, Gembase & Oracle DB admin. Interact w/ customers to evaluate business processes, interface btwn software & hardware, data processing & information requirements, & system resources. Research & recommend data communications solutions. Formulate & design software systems, applications, programs, & architecture. Utilize SQL, Unix, & Oracle. B.Sc. in Comp. Sci., IT, Math, or Eng'g & 3 yrs exp. in position offered or as DBA, Syst Analyst, or SW Eng'r. 40 hrs/wk 9 to 6, M-F. EOE. Send resume & cvr. ltr. to: Attn: Global Business Systems, Alcoa CSI, 6625 Network Way, Ste 200, Indianapolis, IN 46278.

Business Systems Analyst to analyze, develop integrated comp systems for hospitality supply industry using SAP; interact with customers/industry partners; identify /implement SAP Functional/System enhancements to improve system efficiency; provide functional expertise to assure data integrity between integrated software appls; provide SAP training to current/new staff. Require: B.S. or foreign equiv. in CS/Bus Admin with 2 yrs exp in SAP systems. In lieu of BS, 3 yrs of academic studies in one of the above plus 1 yr of work exp in SAP systems will be accepted. High salary. Responses to: Three R Hotel Group, 1300, 319 E. Bypass N, Moultrie, GA 31788.

Jr. Consultant sought by NYC Computer Consulting firm to analyze user needs, to dsgn, dvlp & implmt medium to large scale applics using technologies such as Crystal Reports, VB, VB Script, MS Access, MS SQL Server, Sybase Adaptive Server, MS Win 95/NT. Must have MS in Comp Sci or Engg, Info Systems Engg or related w/1 yr relevant work exp. Send resume to Gemini Systems, HR #JCDH, 61 Broadway, Ste 925, NY, NY 10006.

Senior Staff Engineer (Denver, CO) - Serve as a tech consultant to eng management in telecom transmission eng using knowledge of design concepts for telecom networks; system design principles for long-distance links; digital trans systems; fiber optic cables/associated propagation techniques; trans eng design for fiber optic systems; networking principles; telecom traffic eng; & SONET systems. Provide advanced tech leadership in design, analysis & problem solving efforts to special design team, tech review team, or problem resolution team. Work independently & exercise considerable latitude in defining & pursuing special advanced telecom eng projects. Initiate & execute advanced research & development activities. BS EE, Systems Eng, or related + 5 yrs related exp + working/theoretical knowledge of: Design concepts for telecom networks; System design principles for long-distance links; Digital trans systems; Fiber optic cables/associated propagation techniques; Trans eng design for fiber optic systems; Networking principles; Telecom traffic eng; & SONET systems. $82,949/yr. M-F. 40 hrs/wk. Must have proof of legal authority to work permanently in the U.S. Application by resume only to: EMPLOYMENT PROGRAMS, PO BOX 46547, DENVER, CO 80202 & refer to order#CO5041851

Programmer Analyst. Sought by Englewood Colorado consulting company to work in various unanticipated locations throughout the U.S. Under direct supervision, analyze, plan, develop, test and document computer programs including business and web applications and network communication programs. Evaluate user requests and software program requirements for new and modified programs. Write specifications, code, test and debug computer programs. Use of Oracle, Java, JavaScript, MQ Series, JSP, EJB, J2EE, WebLogic, UNIX, Servlets and Windows NT. Reqs. Bachelors or equivalent in Computer Science or related degree. Plus 1 year in the job offered or 1 year in a related occupation including Systems Analyst or Web Developer or related experience. Will accept 3 years of college education and 3 years experience in lieu of required education and experience. $63,000/year, 40/hrs/wk, 9AM-5PM. Respond by resume to EMPLOYMENT PROGRAMS. PO Box 46547, Denver, CO 80202, and refer to Job Order No. CO5042383.

SENIOR PROGRAMMER/ ANALYSTS

MARA CONSULTING, INC., a Califomia-based Corporation, has immediate openings for Senior Programmer/Analysts with at least five years' experience in Natural/ ADABAS/Programming who have worked on IBM mainframe platforms utilizing MVS/XA ESA and OS/390 Operating Systems. Applicants must also have at least four years of formal academic training in computer data processing, Computer Science or a related field culminating in government diplomas or a Bachelor's Degree. Must be willing to trevel from the Sacramento, Califomia area to temporary work sites throughout the United States to be paid, at least, the prevailing wage in that area. Employees will remain employed by MARA CONSULTING, INC.. (www.maracon sulting.com) with continuing benefits. Send your resume with current address and telephone number to MARA CONSULTING, INC., 8577 Almond Bluff Court, Orangevale, CA 95662 or email to maracons@pacbell.net. EOE

Avon, a world leader in the health and beauty products industry is seeking a Technical Manager, Webmaster at its headquarters in NYC. The Technical Manager, Webmaster migrates all the existing sites to Interwoven Teamsite Server. Develops and designs templates, Data capture forms and workflows. Designs and develops internet and intranet websites for the company utilizing technologies such as CGI scripting in PERL, JavaScript/ VPScript, JAVA ASP, Cold Fusion web development tools, Flash, Photoshop, UNIX, NT Teamsite server administration. Develops a Content Submission System. Provides local technical support to the web content team. Performs server side management of Teamsite server.

Must have a Bachelor's or foreign equivalent degree in Computer Science or Engineering and 2 years experience. The required experience must include: (i) 2 years in Web site development in Interwoven Teamsite Server; Web Development and Web development tools; HTML, ASP, Java, JavaScript, XML, VB Script, CGI Programming - PERL, C++; and (ii) 1.5 years in SQL Server, MS Access, Photoshop, and Flash.

Please send resume to: Attn: HR Specialist, Avon Products, Inc., 1345 Avenue of the Americas, New York, NY 10105. Fax: (212) 282-6149. E-mail: jobs6@avon.com

Software Developer, Internet Applications wanted to develop & maintain customer-centric internet applications that maintain & enhance company's leadership position; develop & deploy eCRM platform to customize & automate business transactions with constituents using Delano for encapsulating business logic such as survey forms/questionnaires, e-mail attachments, newsletters & periodic updates; use T-SQL to extract data from SQL Server database; implement eCRM pilot projects consistent w/ strategic initiatives, using state-of-the-art tech. such as XML, ASP, Perl, Lotus Notes/Domino, & OCR for Forms, provide support from Tech. Services to Marketing & other business units for customer-focused technology products & services; support Tech. Services in adapting, modifying, & /or replacing existing technologies to create & maintain comprehensive integrated user services. Must have Bach. deg. in Comp. Sci. or related field, & 2 yrs. exper. in Internet & relational database design, development & production in a realtime production environ. w/ reporting & data analytical skills, incl. exper. in developing with HTML, XML & ASP, Lotus Notes/Domino, Delano & scripting in OCR for Forms. Salary $68,000/yr. Send 2 resumes to Case#200201292, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Programmer/Analyst: Dev sports related websites. Understand/define client req.; design, dev, test/implement solutions, use Visual Basic/other programming technologies. Dev reusable object library. Req: 3 yrs exp. 9a-5p. Resume: E. Derechio, TWI Interactive, 20 Guest St., #400, Brighton, MA 02135.

Lead Software Release Engineer: Responsible for all aspects of the planning, design and development of support software product lines. Duties include building and leading project teams in development activities for high quality software, meeting tight market deadlines. Ensures development of software requirements and specifications. Works in C/C++, UNIX Wind River Systems support systems. Reviews, evaluates and approves software project technical proposals, methods, and schedules. Manages technical staff to achieve design objectives. Monitors progress on projects to ensure fulfillment of product scheduling objectives. Works with Module Development to integrate software and hardware compatibility issues. Participates in TQM activities, including responsibilities designed for the company Quality System and ISO 9000, oriented at continuous process improvement in Software Engineering as well as in overall product development. Requirements include a Bachelor's degree or equivalent in Computer Science, and Engineering discipline or related field and three years of experience in the job offered or related field of system software product development. Applicants must have unrestricted authorization to work in the United States. Salary $89,257-$100,000/year. 40 hours/wk. "Respond with two copies of resume to Case #200200420, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

PRINCIPAL SOFTWARE ENGINEER. Design, implementation, testing and maintenance of software components and subsystems which are incorporated into one or more company software products; utilize contemporary techniques and tools including Visual C++, Microsoft Foundation Classes and Various Microsoft Windows multimedia APIs to develop software; works with product features relating to visual display and synchronization, user interface, utilization of DirectX filtergraphs, and audio recording and playback "engine', duties include project management and design utilizing knowledge of Windows system internals and digital signal processing (DSP). Requires B.S. or equivalent in Computer Science, Mathematics, Electrical Engineering or Physics plus 5 years exp. in job offered or 5 years directly related experience including image processing and audio/music. Rate of Pay: $110,000/year. Hours: 40/week-9 am to 5pm. Reply by resume only (2 copies) to Case #200201326, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

VP - Solution Engineering & Consulting. Lead a group of Engineers responsible for developing and deploying Real Time Locating System (RTLS) solutions. Requirements and duties to include: Managing the development and deployment of new applications. Directing complex projects requiring system integration, hardware engineering and software development. Manage product complexity and versioning control. Integrate wireless networking S/W & Radio Frequency (RF) hardware devices. Degree in Computer Science/Engineering and extensive experience req'd. Job location is at Newton, MA. Send resume to Thomas Bacon, WhereNet Corporation, 5920 St Clair Highway, China, Michigan 48054.

SENIOR SYSTEMS ANALYST

The Senior Systems Analyst SAP Business Warehouse Reporting position has primary responsibility for maintaining and supporting the ConAgra SAP Business Warehouse Reporting Tools. This will include providing consultative services and implementing reporting solutions for the SAP ConAgra Operating Units, and providing customer training and support for the reporting tools. At the direction of the Manager for Enterprise Data Warehouse and Reporting, the incumbent will work with the Data Warehouse Team, Operating Units and business constituents to successfully deliver Enterprise Data Warehouse projects for the application of information technology. Will conduct the design, development, implementation and support efforts of the SAP Business Warehouse Reporting applications; perform execution of systems maintenance, enhancement and production support to ensure that service level expectations for functionality, performance, security and control are fulfilled; ensure that methodologies, architectures and standards for systems development are used in the areas of structure systems development life cycle, time accounting, systems documentation, development architectures, coding and testing standards, quality assurance and change control, and configuration management. Position requires minimum of a Bachelor's degree in Computer Science, Business or a related field and four (4) years experience in a position that involves implementation of complex systems projects. Position fulltime, M-F. Salary $75,000/year. Job is located in Omaha, Nebraska.

Interested applicants may submit their resumes to www.conagrafoods.com, click on "careers", then "apply now". Note: You must type in the following code of **C-CMIS253** in the box labeled "In what job are you interested" in order to apply for this position. Failure to correctly enter this information will result in non-consideration for the position. You may also submit your resume to ConAgra Foods, Inc., Attn: Judy Mincey, Human Resources CC-255, One ConAgra Drive, Omaha, NE 68102.

SYSTEMS ANALYST II & ANALYST, LEAD WEB SYSTEMS IT

ADT Security Services, Inc., has immediate openings in its Aurora, Colorado and Boca Raton, Flonda offices for experienced Systems Analysts.

Must possess at least a bachelor's in Computer Science or a related field and relevant work experience with Oracle Applications, Oracle Databases, Oracle Tools and PL/ SQL for Aurora opportunity or relevant supervisory/lead experience with small teams and web development experience, including Cold Fusion, J2EE technologies and Electronic Data Interchange (EDI) for Boca Raton opportunity.

Resume and/or cover letter must reflect each requirement above and specify reference code SAHM /ALPS or it will be rejected.

Forward resume to Theresa Maia. ADT, One Town Center Road, Boca Raton, FL 33486-1010.

Business and Ouality Assurance Analyst (BA/QA) needed to take part in defining Visibillity's testing process and protocols, develop test scripts with the BA/OA Team, execute testing plans using manual, automated, and performance test scripts. The BA/QA will also work with Application Developers and the Product Team to ensure test scripts accurately test against requirements, user interface design, and user acceptance, identify & resolve application issues with application developers and assist the technology infrastructure team in testing scalability, security, etc. Ideal candidate must have Masters in Computer or related field, a BS in Engineering or Computer related field Must have knowledge of SOL. ASP. Visual Basic. HTML. JavaScnpt. MS Visio and MS Project. This is a full time position, from 9a.m. to 5p m Please fax or send resume to Shan Gerencher at (312) 577-0789. Visibillity, tnc , 225 N Michigan, Suite 1600, Chicago, IL 60601

PRINCIPAL SOFTWARE ENGINEER: Duties include: PSE responsible for applying SW engineering principles, processes, theories and concepts on multiple platforms, operating systems and computer architectures to develop highly complex computer SW solutions for business applications. As technical and team lead for development groups, PSE will: assess, design, and document detailed functional specifications and requirements; and implement, test and debug highly complex modules. Duties include: determine technical requirements for project; assess and implement metric measures; perform cost/benefit analysis at project or cross-platform level; develop multi-thread network applications and services using C and C++; development of drivers; and implement security protocols. Effectively communicate with team members, management and clients on project progress, modifications and solutions. Min. Reqs.: MS (foreign equivalent accepted) in CS, EE or related plus 2 yrs exp. in the job offered or in a related occup. performing SW engineering, design or development OR in the alternative BS/BA plus 5 yrs progressive exp. in job offered or in related occup. performing SW engineering, design or development PLUS, all candidates must possess demonstrated knowledge and work experience with: (1) SW development of multi-threaded network applications and services using C and C++; (2) Manipulation of device drivers or virtual drivers; and (3) Implementation of security protocols (e.g., IPSec, TLS, Radius). Basic pay os $88,000 per year FT and standard company benefits. EEO. Submit 2 resumes and respond to Case No. 2002 00696, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114.

Junior Programmer (North Palm Beach, FL): Write and fix system software in PERL, HTML and JAVASCRIPT in a Unix Environment. Program Perl Modules/APIs utilizing ODBC/ DBI utilities. Produce system documentation for new products. Technical support for website and performance degradation. Troubleshoot reservations systems, including writing code. Utilize knowledge of Apache running Raven and Modperl, XML, Perl, Perl ODBC/DBI, HTML, Javascript, Window NT and Windows 2000, Unix, PVCS, Sabre and Pegasus. Minimum of Bachelor's degree in Computer Information Systems; and 6-month experience in job offered or 6-month experience as a Technical Support Assistant. 40 hour/ week, 9 a.m. - 5:30 p.m.; $46,000/year. Please send two resumes to: Jean Wroblewski, President, WorldChoice-Travel.com, Inc., 11300 U.S. Highway 1, Suite 300, North Palm Beach, FL 33408.

Full time position to work as System Engineer, Requires knowledge and technical background coupled with broad functional knowledge in Supervisory Control and Data Acquisition (SCADA) systems. Primary requirement is expertise and strong skill set in C, C++, shell scripting, network programming, Pro *C, PL/SOL, Oracle Database and Unix system administration with dbx, gdb, clearcase, CVS, RCS preferably on DEC Tru64 Unix Industnal automation programming experience with RTU's, PLC's & at least one GUI SCADA software package such as Osker, Intellution FIX32, ONSITE 9 x is required on Windows XP Developer2000, SAMMI, TOAD is desirable. Requires Master of Science degree in Computer Engineering or equivalent and 1 year of experience in the job offered Applicants should send resume to Pyramid Consulting Inc, 8665 Providence Dnve, Noblesville, IN 46060.

SYSTEMS ANALYST

Under general direction, will provide application support for a warehouse management system. Will facilitate and perform analysis, design and programming; testing and implement systems and enhancements; work across projects to synchronize project plans and deliverables including project planning, project management, structured systems development life cycles, time accounting, systems documentation, coding and testing standards, quality assurance and change control and configuration management, develop cost analysis estimates; and, perform troubleshooting, root-cause analysis, solution development and implementation of large and/or multiple projects. Experience working with cross-functional information technology organizations and advanced knowledge of software development practice, concepts, technology and methodology required. Position requires minimum of a Bachelor's degree in Computer Science, Business or a related field and two (2) years experience in field of information technology related to an Open Systems Applications Development environment. Previous experience supporting warehouse management systems (Red Prairie, EXE, Catalyst) preferred. Position located in Schaumburg, Illinois. Fulltime, M-F. Salary $80,496/year.

Interested applicants may submit their resumes to www.conagrafoods.com, click on "careers", then "apply now". Note: You must type in the following code of C-CMIS254 in order to apply for this position. Failure to correctly enter this information will result in non-consideration for the position. You may also submit your resume to ConAgra Foods, Inc., Attn: Judy Mincey, Human Resources CC-255, One ConAgra Drive, Omaha, NE 68102.

Senior Software Engineer: Responsible for designing, specifying, coding and testing of new features as well as participating in code reviews and design discussions for additions to HACMP software the company produces. Duties include: writing functional requirements; working on complex technical designs and producing design documents; technical mentoring of junior engineers, reviewing functional requirements and design documentation of less senior engineers; coding and testing own features and components of other features; and fixing most defects. Utilize knowledge of Unix networking, Unix Systems Programming, Distributed Systems or Availability Management. Requirements include a Bachelor's degree or equivalent in Computer Science, Electronics or related Engineering field with at least five years of work experience in the job offered or related field of software engineering. Applicants must have unrestricted authorization to work in the United States. Salary $90,461/year. 40 hours/wk. Respond with two copies of resume to Case #200200827, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

KidSmart Software Co. is looking for programmer/system analysts. Qualified candidates must have minimum BS. Exp. using PowerBuilder 7.0, Data Architech 6.0, Citrix Server, Sybase (ASA8.0), MKS is plus. Good salary with full benefits. Please epply at jobs@kssc.com. EOE.

Programmer or system analysts wanted by RS Systems Company. Ideal applicants should have BS with experience. Skills in following areas preferred: Coldfuslon, Java, JavaScript, DreamWeaver, HTML, VBScript. Send resume with wage request to jobs@rssystems.com

Software Engineer with Bachelor's degree in Computer Science and two years experience in development using .NET framework, Peoplesoft 8.0, software development life cycle under CCM level 5, ISO 9002 . Send resume to: International Computerware, Inc., 277 Main Street, Marlborough, MA 01752.

Software Engineers - Responsibilities include design, development, testing and implementation of multi-user, real time applications using COBOL, CICS, DB/2, JCL, VSAM, EASYPLUS and MVS in a mainframe environment. Perform detailed business analysis and develop efficient and flexible applications in batch and on-line modes. 2 Years experience on the job with a Master's degree or 5 years with a Bachelor's degree in Engineering/Science/Mathematics or equivalent. Salary:$89K/Year. Please send applications to 705 Mermaid Dr #308 Deerfield Beach FL 33441 USA.

Software Engineer: Dsgn and dvlp med. s/ware applns using C++, SQL Svr, MUMPS & related tools: Install, admnstr & maintain network sys; Database admin; Remote cust support thro WAN; Dsgn & dvlp CACHE Database Sys. Requires BS or eqvlnt in Comp Eng & 5 yrs exp in applN dvlpmnt and/or sys admin and/or network eng and MCSE for Win 4.0. Apply: Integrated Informatics, Inc, 1805 Old Alabama Rd, Ste 320, Roswell, GA 30076. Email: kaps@ii-i.com

Consultant sought by NYC Computer Consulting firm to analyze user needs, to dsgn, dvlp & implmt medium to large scale applics using technologies such as Lotus Notes/Domino, Lotus Script, C/C++, SQL & HTML. Must have BS in Comp Sci or Engg, Info Systems Engg or related w/2 yrs of relevant work exp. Send resume to Gemini Systems, HR #CMG, 61 Broadway, Ste 925, NY, NY 10006.

MphasiS-BFL Ltd. and its subsidiary MphasiS Corporation has multiple openings for the following positions at its office in New York and unanticipated client sites throughout the U.S.: Programmer Analyst, Software Engineer, Project Manager, Management Analyst, Sales Engineer, Business Development Manager, Finance Manager. Please send resume and salary history to: hr@mphasis.com or mail to 444 Park Avenue South, Suite #503, New York, NY 10016.

Seeking qualified applicants for the following positions in Memphis/Collierville, TN: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree* in computer science, MIS, engineering or related field plus 5 years of experience in systems/applications development. Experience with ClearBasic programming also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

Seeking qualified applicants for the following positions in Memphis/Collierville, TN: Senior Programmer Analyst. Formulate/define functional requirements and documentation based on accepted user criteria. Requirements: Bachelor's degree* in computer science, MIS, engineering or related field plus 5 years of experience in systems/applications development. Experience with Oracle and UNIX Scripting also required. *Master's degree in appropriate field will offset 2 years of general experience. Submit resumes to Sibi George, FedEx Corporate Services, 1900 Summit Tower Blvd., Suite 1400, Orlando, FL 32810. EOE M/F/D/V.

COMPUTER SYSTEMS ENGINEER wanted by hardware & systems support Co. in Houston, TX. Must have B.S. in Comp. Engineering (or Electronic & Comp. Engineering) plus exp. Respond by resume only to: Mr. S. Ye ID-Melody Computers, Inc. 5800 Ranchester, Ste 160, Houston, TX 77036.

Programmer Analyst, Wilmington, DE. Bachelors in Comp. or Electronics or MIS + one year exp. in design, develop and implement net enabled applications utilizing Java, HTML, XML, Java/RMI, CORBA, EJB, C, SQL, and PL/SQL and do OOP using C++ and C # for Windows 95/98/NT & Unix; design GUI using VB, Visual Age for Java and Developer 2000; design & develop RDMBS using Oracle, SQL Server, MS Access, DB2 and generate reports using JDBC, Forms 5.0, Reports 2.5. Respond to HR Dept, Neotech Solutions Inc., 1170 Broadway, Suite 314, New York, NY 10001.

System and network administrator wanted by Printing Industries of Michigan Service Corp. Duties include system & network administration, install & configure servers, user support. Must have BS or equivalent with CCNA, MCP, MCSE. Please apply at nick@print.org. EOE.

Comp Consults is looking for programmer/system analysts, engineers or IT consultants. Our minimum requirement is BS plus some experience in following area: Oracle, Unix, C/C++, VB, Java, J2EE, EJB, XML, XSL/XSLT. Please send resumes to immg@compconsults.com. EOE

Exp'ed Prog/Sys Analysts, DBAs, Syst Admins, S/W Engineers required for branch locations in Elgin, IL, Lower Gwynedd, PA and Cherry Hill, NJ. Skill sets C, C++, Java, Wireless, HTML on UNIX/Windows; VB, VC++, PB; Oracle, PL/SQL, Pro*C; VLSI/ASIC design, VHDL, C, C++, Shell scripts; UNIX, Windows Sys. Admin; COBOL, CICS, DB2. Require BS/MS in CS/Engg(any branch)/Math/Business/Science (or its foreign equiv and/or equiv. in edu & exp.) and relevant exp. Travel required. High salaries. Resumes to: HR, Fourth Technologies, 585 Tollgate Road Suite I, Elgin, IL 60123. Indicate on resume the branch office you are applying for.

Innovision Technologies, a dynamic company, is looking for system analysts, IT professionals and software/project engineers. BS plus some experience is required. We offer attractive wage with full benefits, 401k and job is stable. Please send resumes to iti@innovisiontech.com EOE

Synergy has openings for IT professionals or engineers. Qualified applicants must have BS/MS with some experience. Strong background in TCP/IP Suite, Unix, DB2, Oracle, VB, SQL, IIS, Window NT and XML is plus. Send resumes to hr@synergycom.com. Travel is required. EOE

Sr. Programmer Analysts - Job Entails and requires experience in design and development of applications using BAAN, Triton, SAP, Siebel, WinRunner and SEI-CMM. Software Engineers-Job entails and requires experience in design and development of applications using Oracle Applications (GL, OM, OE, PO and INV), Oracle, VB and Unix. Job Location: Dublin, OH. Relocation within USA Possible. Attractive compensation package. Send resume to Priya Venkat, Technology Software Inc., 5708 Clearfield Lane, Dublin, OH 43016.

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Farmers Telephone Cooperative has a Programmer Analyst opening in Kingstree, SC. Duties include design,develop web-based software applications especially for wireless communication industry; support, enhance web-based software applications, systems analysis, integration, coding, and testing. Skills include Java, Servlets, JSP, and RPGILE programming. BS in Computer Science, Engineering or related field, 3 years experience. Send resume to FTC, Human Resources Administrator, P.O. Box 588, Kingstree, SC 29556.

Software Engineers to design, develop, implement & maintain engineering, business, accounting & management info applications & systems. Bach. in C.S., Physics or Engineering + 5 yr exp or Master in CS req. Send resume to Span Systems Corp., 230 Sherman Ave., #9, Berkeley Heights, NJ 07922.

International Programming & Systems, Inc. has employment opportunities for Systems Analysts with any of the following skills: COGEN; SAPIENS; TERADATA; VB. Developers exp. in STRATUS, UNIX; UNIX Systems Admin and Network admin. Positions are available throughout the US inc. Hamilton & W. Trenton NJ, Philadelphia, PA, Seattle, WA. IPS also has openings for Sales and Recruiting staff in our San Francisco office. Electronic responses are encouraged, cflavell@ipsamerica.com or mail resume to IPS, 1875 So. Grant Street, #300, San Mateo, CA 94402 (Fax) 650-572-8679. Principals only please.

Software Engineer to design, develop, test, implement web based applications using VC++, COM, ISAPI, Java, EJB, JSP, J2EE, MS SQL, C, NSAPI, WAP on Linux and Windows platforms. Tasks include System Architecture, and recommendation of Architecture and technology. Masters degree in computer science and three years experience. Send resume to Datum Software Inc, 6525 The Corners Parkway, Suite 312, Norcross, Georgia, 30092.

Software Dev. Comp. located in New Jersey & California req. Software Engg. w/MS & 1 yr. exp. or its equiv. & Prog. Analyst w/BS & 2 yrs. exp in foll:

JD Edwards, HP-9000, IBM, AS/400, Oracle, DB2, Win NT, SQL/400, Cobol/400, JDE World Case, VB, VC++, COM/DCOM, Java, HTML, XML, ASP, JavaScript, SQL Server, UML, Object Oriented, Distributed Networking Systems.

Excel. Benefits, Apply with resume to Attn: Recruiter, Systime Computer Corp. formerly Compuware Solutions, Inc. 181 Metro Drive #500, San Jose, CA 95110.

SAP CONSULTANTS Develop & implem functional modules such as FI/CO, MM, SD, PP. ABAP Progr.

PROGR ANALYSTS & DESIGN ENGINEERS Design, develop, implem, data migration, testing of Bus Appln, PDM systems-Metaphase/ Windchill/ Enovia, Auto Components. Skills such as C, C++, Java, Oracle RDBMS, SAP, Unix.CATIA,Pro Engineer, CAD/CAM req'd. ICAD & other KBE OO sys devel need CAD/CAM/CAE exp.

BS, MS or equiv in CS, Mech, EE, Bus Adm, Finance or related field; & 1-5 yrs exp in the req'd area.

Positions available in Detroit, MI & at client sites throughout US. PIs mail resume to HR, 33533 West 12Mile Rd, #131, Farmington Hills, MI 48331

Software Engineer-Systems Analysis & Programming: Perform requirement analysis, design, programming, testing and implementation of telecommunications usage rating and invoicing system; develop and direct software systems to process local and long distance usage and products including rating, taxing, promotion application, reporting and revenue interfaces; provide 24x7 production support; impiement monthly changes to comply with taxing rules and rates and International and National Terminating Point Master databases. Requires a bachelor's degree in engineering, computer science or management information systems, or will accept bachelor's equivalent based on a combination of education and/or experience as determined by a professional education or experience evaluation service; also requires 2 years experience in the job offered or 2 years experience in the design and development of telecommunications usage rating and invoicing system. Salary range $68,000 to $74,000/yr; 40 hrs/wk, 8AM to 5PM, Monday to Friday. To apply, submit two (2) copies of your resume to: Case #200200773, Labor Exchange Office, 19 Staniford St., 1st Flr., Boston, MA 02114. EOE.

Programmer/Analyst to design, develop, test, implement, maintain and support web-based software in a client/server environment using JAVA,J2EE, JSP, HTML, SERVLETS, EJB, JDBC, SWING, CORBA, RMI, TCP/IP SOCKET, VISUAL BASIC, XML, ASP, C++, ORACLE, WEBLOGIC, WEBSPHERE, NETSCAPE APPLICATION SERVER AND SERVICES ON UNIX, SUN SOLARIS AND WINDOWS Platforms. Require: BS Degree in Science, an Engineering discipline, or a closely related field with 2 years of progressively responsible experience in the Job offered or in the related occupation of Software Engineer. Extensive travel on assignments to various client sites within the US is required. Competitive Salary offered. Apply by resume to: Ravi Kandimalla, President, Everest Computers, Inc. 900 Old Roswell Lakes Parkway, Suite 300 Roswell GA 30076: Atten: JobMY

Pinnacle Talent, Inc., a premier IT Projects Consulting and Services company, has immediate, full-time opportunities for:

Software Engineers to research, design, and develop computer software systems, in conjunction with hardware product development, applying principles and techniques of computer science, engineering, and mathematical analysis, formulate and design software system, will use a variety of software tools including; PowerBuilder, TPF, Sybase, Perl, Solaris, Java and/or Corba. Master's degree or foreign edu. equiv. of same and 1yr exp. required

Systems Analyst to analyze user requirements, procedures, and problems to automate processing or to improve existing computer system: review computer system capabilities study existing information processing systems, develop new systems to improve production will use a variety of software tools including; SAP R/3 Basis Administration, Oracle DBA, PL/SOL, Automated Testing Tools viz, Winrunner, Loadrunner, UML, Rational Rose, Websphere, Weblogic, Solaris, Unix and/or Windows. Master's degree or foreign edu. equiv. of same and 1yr exp. required

Programmer Analysts to plan, develop, test, and document computer programs, applying knowledge of programming techniques and computer systems: evaluate user request for new or modified program, formulate plan outlining steps required to develop program, using structured analysis and design. Design new code/program or replace, delete, or modify existing code/program to meet client needs, will use a variety of software tools including; SAP/R/3, ABAP/4, Oracle Applications, PL/SQL, Java, J2EE, Java Servlets, MO Series, Rational Rose, Websphere, Visual Basic, PowerBuilder, Oracle Database, C, C++ and/or Embedded Software. Bachelor's degree or foreign edu. equiv. of same and 1yr exp. required

For some positions, we also accept the degree equivalent in edu. and exp. Travel and/or relocation required. Send confidential résumé, salary requirements and position applying for to: **Pinnacle Talent, Inc. Attn: HR 1919, Midwest Road, Suite 210, Oakbrook IL 60523.**

Programmer/Analyst to analyze, design, develop, test, maintain, implement and support web based application software in a client/server environment using Java, J2EE, EJB, JSP, Servlets, JDBC, JavaBeans, XML, XSLT, WebLogic, Apache, PL/SQL, SQLJ, Oracle, MS-SQL Server, UML, Rational Rose operating under UNIX and Windows Platform. Require: BS Degree in Computer Science, an Engineering discipline, or a closely related field with 2 year of progressively responsible experience in the Job offered or in the related occupation of Software Engineer. Extensive travel on assignments to various client sites within the US is required. Competitive salary offered. Apply by resume to : Ravi Kandimalla, President, EVEREST COMPUTERS INC., 900 Old Roswell Lakes Parkway, Suite 300, Roswell, GA-30076: Attn: JobMP

SOFTWARE ENGINEER to design, develop, enhance and maintain web-based application software and electronic invoicing systems using ASP.NET, Visual Basic, VB Script, Access, SQL Server and COBOL under Windows and UNIX operating systems. Require: B.S. degree in Computer Science/ Engineering, or a closely related field with five years of experience in the job offered or as a Systems Analyst. Competitive salary offered. Send resume to: Appsoft Technologies, Inc., 638 Hillandale Circle, SW, Marietta, GA 30064; Attn: Job VO.

Business Objects has an opening for the position of Regional Solutions Specialist to be based out of the Middleton, WI area. DUTIES: Utilize FORTRAN and HPUX expertise to Support Western Region ("WR") Pre-Sales organization's advanced Business Objects technologies, such as extranet implementations, software customization, network and data security, and application integration, among other emerging technologies. Provide technical support by telephone and in person. Provide advanced technological support and training to pre-sales team through preparation of customized demonstrations, white papers, and educational seminars. Construct educational and technical resources. Provide clear resource for field questions and cross-trains. Conduct individual research and testing. Ensure clear documentation of technical solutions implemented by the WR in order to build a library of technical field information for the pre-sales staff. Facilitate the creation of best practices documents for product implementation. Collaborate with and interface between groups to provide timely transfer of knowledge of new products and methodology. Create customized demos. Ensure advanced technical support and consultation for the WR. Utilize expertise in planning/executing large systems projects/IT plans to recommend and architect enterprise Business Intelligence Systems. REQUIREMENTS: Bachelor's degree or equivalent* in Business, or CE/Physics/other quantitative or scientific field, plus one (1) year experience in job offered or as Presales Engineer/Consultant, Systems Engineer or related. * Equivalent means a degree recognized by a professional evaluation service to be the equivalent of a bachelor's degree awarded by a US college or university. Experience/academic curriculum to include UNIX System administration for HPUX operating system, FORTRAN programming, large/long-term systems projects and IT plans for organizations, construction/testing of large distributed computer applications. To apply for a position visit our website at www.businessobjects.com/careers or forward your resume (ref CW0428) to: Business Objects Americas, Attn: Staffing, 3030 Orchard Pkwy, San Jose, CA 95134. EOE

Hexaware Technologies, Inc. has immediate, full-time opportunities for:

Software Engineers, To research, design and develop computer software systems, in conjunction with hardware product development, applying principles and techniques of computer science, engineering and mathematical analysis, formulate and design software system, will use a variety of software tools including; PowerBuilder, TPF, Sybase, Perl, Solaris, Java, Corba. Master's degree or foreign edu. equiv. of same and 1yr exp. required.

Systems Analyst to analyze user requirements, procedures and problems to automate processing or to improve existing computer system: review computer system capabilities study existing information processing systems, develop new systems to improve production will use a variety of software tools including; Apache, Java, JDBC Oracle, PL/SQL, Servlets, Rational Rose. Master's degree or foreign edu. equiv. of same and 1yr exp. required.

Programmer Analysts to plan, develop, test and document computer programs, applying knowledge of programming techniques and computer systems: evaluate user request for new or modified program, formulate plan outlining steps required to develop program, using structured analysis and design. Design new code/program or replace, delete, or modify existing code/program to meet client needs, will use a variety of software tools including; Cobol, C, Fortran, Visual Basic, Oracle, Solaris. Bachelor's degree or foreign edu. equiv of same and 1yr exp. required

For some positions, we will also accept the degree equivalent in edu. and exp. Travel and/or relocation required. Send confidential résumé, salary requirements and position applying for to: Hexaware Technologies, Inc. Attn: HR, 4343 Commerce Court, Suite 618, Lisle, IL 60532

Department of Computer Technology

Purdue University's Department of Computer Technology invites applications for a tenure-track, assistant professor position at its West Lafayette home campus beginning in August 2003. The department's mission focuses primarily on teaching, educational and applied research, and industry/professional outreach. The position is focused on areas of database administration, database programming, and advanced database applications. The selected candidate must participate in both undergraduate and graduate education assignments. All candidates must have an earned Masters Degree (PhD preferred) and at least three years of industry experience. Preferred candidates will have knowledge and/or experience in: deductive and knowledge databases; object-oriented databases; spatial and temporal databases; data warehousing and knowledge discovery; multimedia databases; and semistructured data and XML. Applications will be accepted until the position is filled. Send a detailed resume and academic transcripts to CPT Search and Screen Committee, Ad Code CW, Department of Computer Technology, Purdue University, 401 N. Grant St. W. Lafayette, IN 47907-2021.Questions should be directed to Professor Erick Slazinski (West Lafayette) at phone (765) 496-7582, or on the Internet at edslazinski@tech.purdue.edu. Purdue University is an equal opportunity, affirmative action employer.

PURDUE UNIVERSITY

SOFTWARE APPLICATION ENGINEER

Perform analysis of NASA/USGS geo-science data and engineering of software to support the Global Earth Science communities. Development and support for analyzing, developing and maintaining data and software systems to support archival of DAAC, NASA, and US geological survey datasets. Responsible for NASA's SIR-C/X-SAR (Spacebom Imaging Rada-C/X-band Synthetic Aperture Radar) data and systems. Knowledge required in multi-parallel processing systems, analysis of raw/processed SAR and interferometry data. Concentration toward a long-term vision and support required to maintain historical data. Key skills require strong base in science with a possible focus toward atmospheric/geological science, complementing software engineering skills and Aqua/Terra/Arial remote sensory knowledge. Programming knowledge of C, C++, Java, Fortran, Oracle, SOL/PLUS, server-side development skills and device I/O programming. 40 hours per week. $47,320/year. 8:00 a.m. to 5:00 p.m. Master's degree or equivalent in Computer Science/Geoscience or related field. Must have proof of legal authority to work in the United States. Send your resume to: South Dakota One-Stop Career Center, 811 E. 10th Street, Sioux Falls, SD 57103-16500, #605-367-5300(T), #605-367-5308(F). Please refer to Job Order #SD1224280.

PROGRAMMER/ANALYST

Analyze existing and proposed/new medical/clinical equipment. Evaluate medical equipment specifications and user requirements. Design, develop and program systems/applications for interfacing medical equipment with applications. Customize programs as required. Implement, verify and test interfaces. Set up and monitor equipment and interfaces. Perform quality assurance as required Minimum requirements: Bachelor Degree or equiv in Bio-Medical Engg and 2 years of experience in the job offered or related occupation like Head-Biomedical or Biomedical Engineer. 2 years of work experience on medical/clinical equipment and familiarity with development tools like Pascal, C, Visual Basic, Oracle, Windows required. Full-time position (40/wk, 9am-5pm). Salary: $60031 00/yr, Overtime: n/a. Must have proof of legal authority to work in the United States. Send your resume to the Iowa Workforce Center, 215 Watson Powell Jr. Way, Suite 100, Des Moines, Iowa 50309-1727 Please refer to Job Order IA1101718 Employer paid advertisement.

Senior Software Engineer

Responsibility is to develop complex, multi-tiered applications, espe-cially Internet applications & to design & troubleshoot at all stages of development. Must then interact w/customer to understand & deal w/potential complications or special requirements. In developing application, must formulate & develop application design using object oriented analysis & design techniques, develop & deploy design under operating systems UNIX or NT, as well as conduct application engineering & assist customers in writing applications using assorted tools. Position requires an extensive amount of travel within North American region. Rqrs: Master's in CS, Engineering, or related field or equivalent. BS and 5 years of post-baccalaureate progressive experience in position or a related occupation will substitute for a Master's. Also rqrs: knowl. in server side Java or C++; knowl. in developing in UNIX or NT; knowl. in development using object-oriented analysis & design techniques: knowl. in various technologies & platforms including XML, JavaScript, SOL; & familiarity w/vanous databases, J2EE specifications (including servlets, ejb, jsp), & concepts of Source control, IDEs, & system optimization.
8:30a.–5:30p. 40 hrs/wk $87,000/yr. Submit 2 resumes to Case # 200200736, Labor Exchange Office, 19 Staniford St, 1st fl. Boston MA 02114.

J.D. Edwards is a one billion dollar global software company that is enabling collaborative commerce in the connected economy. We currently have openings in a number of areas, at all levels, including: software developer, business software developer, programmer/analyst, internet programmer, software quality assurance engineer, business software quality software engineer, technical consultant, web developer, database administrator, technical specialist, technical support specialist, applications consultant, and other IT positions. Positions are available at our world headquarters in Denver and at other locations throughout the United States including San Francisco, Costa Mesa, California, Chicago, Texas, New Jersey, Boston, Charlotte, N.C., etc.. Please visit our website for a complete listing of available job openings, locations and other information: www.jdedwards.com. J.D Edwards is an equal opportunity employer

Software Engineer-Systems Analysis & Programming: Perform requirement analysis, design, programming, testing and implementation of telecommunications usage rating and invoicing system; develop and direct software systems to process local and long distance usage and products including rating, taxing, promotion application, reporting and revenue interfaces; provide 24x7 production support; implement monthly changes to comply with taxing rules and rates and International and National Terminating Point Master databases. Requires a bachelor's degree in engineering, computer science or management information systems, or will accept bachelor's equivalent based on a combination of education and/or experience as determined by a professional education or experience evaluation service; also requires 2 years experience in the job offered or 2 years experience in the design and development of telecommunications usage rating and invoicing system. Salary range $68,000 to $74,000/yr; 40 hrs/wk, 8AM to 5PM, Monday to Friday. To apply, submit two (2) copies of your resume to: Case #200200771, Labor Exchange Office, 19 Staniford St., 1st Flr., Boston, MA 02114. EOE.

Software Engineer-Systems Analysis & Programming: Perform requirement analysis, design, programming, testing and implementation of telecommunications usage rating and invoicing system; develop and direct software systems to process local and long distance usage and products including rating, taxing, promotion application, reporting and revenue interfaces; provide 24x7 production support; implement monthly changes to comply with taxing rules and rates and International and National Terminating Point Master databases. Requires a bachelor's degree in engineering, computer science or management information systems, or will accept bachelor's equivalent based on a combination of education and/or experience as determined by a professional education or experience evaluation service; also requires 2 years experience in the job offered or 2 years experience in the design and development of telecommunications usage rating and invoicing system. Salary range $68,000 to $74,000/yr; 40 hrs/wk, 8AM to 5PM, Monday to Friday. To apply, submit two (2) copies of your resume to: Case #200200772, Labor Exchange Office, 19 Staniford St., 1st Flr., Boston, MA 02114. EOE.

Senior Technical Consultant: Responsible for working with customers and Systems Integration partners. Lead business scope and design workshops, develop, test and deploy billing solutions using MetraTech's methodology and products. Responsible for obtaining and analyzing product and integration requirements, business object functionality, and integration with provisioning and customer care systems. Will outline and communicate business and technical solutions for the customer. Work with MetraTech's engineering and marketing teams to propose specific partnership initiatives as well as product enhancements. Requires: Bachelors in Computer Science and Engineering and 4 years experience in Software Engineering/ Development. Must have hands on knowledge of VC++, MFC, Visual Objects and Crystal Reports. 40hrs/wk (8:00 a.m. to 5:00 p.m.); $90,064.00/yr. Send two resumes/responses to: Case Number 200116126, Labor Exchange Office, 19 Staniford Street, 1st Floor, Boston, MA 02114

Lead Analyst (Boston & Waltham, MA) - Provide tech support & admin for UNIX servers. Manage Solaris & AIX administration of SUN & IBM servers. Work w/ sys development personnel to implement client server based apps. Diagnose & resolve complex sys problems; install, upgrade, & configure UNIX, Solaris, & A3IX servers; create & modify users & groups on server; implement fault tolerance through utilization of VXVM in Solaris & Volume Mgmt in AIX; implement sys security measures. Aid in maintaining corporate standards, policies, & procedures for UNIX environment. Apply knowledge of Sun Solaris UNIX administration, Veritas Volume Mgr, DNS, TCP/IP, C/C++, & shell script programming. Support database servers such as Sybase, Oracle, & Informix. Be on-call at all times to respond to critical problems. Min. req's: Master's in Comp. Sci, Elec. Eng'g, or rel. field, or equiv, no exp req'd. Alternately, will accept Bachelor's in Comp. Sci., Elec. Eng'g, or rel. field + 5 yrs progressively responsible exp in database administration & programming. Must have unrestricted authorization to work in U.S. M-F, 8AM-5PM, 40 hrs/wk. Salary: $85K/yr. An EOE. Send 2 copies of resume to Case No. 200200729, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

Various Openings

We have openings for Design Specialist, Game Designer, Producer, Software Engineer and Programmer/Analyst. Los Angeles areas. Send resumes to 3100 Ocean Park Blvd., Santa Monica, CA 90405

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Sr.Programmer/Analyst to Analyze, design, develop, test, maintain, implement and support web-based and client/server applications using Oracle, Oracle forms, Oracle reports in Unix and Windows Platforms. Require: BS Degree in Science, Business Administration or Engineering or a closely related field with 5 years of progressively responsible experience in the Job offered or in the related occupation of Software Engineer or System Analyst. Extensive travel on assignments to various client sites within the US is required. Competitive Salary offered. Apply by resume to : Ravi Kandimalla, President, EVEREST COMPUTERS INC., 900 Old Roswell Lakes Parkway, Suite 300, Roswell, GA-30076: Attn: JobJP

Programmer/Analyst: Analyze, design, develop, test, implement and maintain customized software applications in a client/server or mainframe environment. Will also provide in-depth trouble shooting and problem solving as well as analysis, design, development and implementation assistance to AS/400 programmers, system administrators, operators and end users. Must have 2 yrs exp. in job offered or 2 yrs exp. in software development. Such experience must include AS400 and related tools. Must be willing to be assigned to unanticipated client sites throughout the United States. Salary: $75,000/yr. Hrs: 8:00am-5:00pm, 40/wk. Please send 2 copies of resume to: Case #200201344, Labor Exchange Office, 19 Staniford St., 1st Fl., Boston, MA 02114.

IT Specialist (Software Engineer) - Render consulting services and provide support and guidance to Web application development and deployment teams at various client sites throughout the U.S. Develop, implement and test web application products utilizing Java, JavaScript, J2EE, EJB and Servlet based on analysis of user requirements. Must have Bachelor's degree or equivalent in Computer Science or Electrical Engineering as well as either two years of experience in the job offered or two years of experience as a Systems Engineer. 40 hrs./wk., 8:00 A.M. to 5:00 P.M., $95,000.00 p.a. Job Order Number WEB 318500. Applicants should send resume to the following address and must reference the job order number: Site Director, Pittsburgh/Allegheny County CareerLink, ATTN: ES Supervisor, 425 Sixth Avenue, Suite 2200, Pittsburgh, PA 15219.

SOFTWARE ENGINEER to design, develop, enhance and test web-based application software using Java, JSP, JMS, EJB, Servlets, JDBC, Java Beans, Java Swing, XML, Oracle, Rational Rose and BEA Weblogic under UNIX and Windows NT operating systems. Require: B.S. degree in Computer Science, an Engineering discipline, or a closely related field with four years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Kevin Barfield, Total System Services, Inc., 1990 Barrett Summit, Suite 200, Vaughn Rd., Kennesaw, GA 30144; Attn: Job LB.

PROGRAMMER/ANALYST to analyze, design, develop, test, implement and maintain client/server and web-based application software for the insurance industry using Java, C++, C, UML, JSP, Servlets, iPlanet Server, SQL Server, SQL and Oracle under Windows 98/2000/NT/XP, Novell, UNIX and SUN Solaris operating systems. Require: B.S. degree in Computer/Systems Science, an Engineering discipline, or a closely related field with two years of experience in the job offered; A M.S. with a demonstrated ability to perform the stated duties gained through academic coursework/previous work experience will be accepted in lieu of the B.S. and two years of experience. Competitive salary offered. Send resume to: Infinity Insurance Company, P.O. Box 444, Birmingham, AL 35209; Fax at 205-803-8406; or E-mail at Jobs@Infinity-Insurance.com; Attn: Job MK.

SYSTEMS ENGINEER

Specify, design, code, test and maintain systems software used by company application in the UNIX environments of Sun Solaris, IBM AIX. Track UNIX technology directions and ensure that company products are tailored appropriately for the UNIX environment. Knowledge of UNIX system services: threads, daemon processes, signals, client-server architecture. 40 hours per week. $65,000/year Master's degree in Computer Science or related field. *Must have proof of legal authority to work in the United States. Send your resume to: Madhavi Bhadbhade, Nebraska Workforce Development, Department of Labor, P.O. Box 94600, Lincoln, NE 68509-4600. Please refer to Job Order #SBAH5-LFME3-17441.*

BSystems Inc. has several openings in S. Dakota, WA & elsewhere for Programmer Analysts, Systems Analysts, Software Engineers & DBAs w/at least 2 yrs exp in any of the foll: ESSCMD, Hyperion Essbase, Hyperion Analyzer/ Planning, Planet, Tomcat, Sun Solaris, PL/SQL, VB, Application Builder, ARCGIS, ARCView, ARCFM, VisualGen 2.2/3.1, CSP, MVS, COBOL, BlueMartini w/J2EE technologies, HP3000 MPE/X, Win NT. Some pos req bach others masters. Equiv deg &/or exp also accepted. Exc. pay & benefits. Please indicate pos applying for. Possible relocation reqd. Mail resume to: HR Dept., 300 N. Dakota Ave, Ste 503-B, Sioux Falls, SD 57104.

PROGRAMMER ANALYSTS req'd for Hickory Hills, IL office. Design & develop software applications using Developer 2000, Designer 2000, VB, Oracle, Cobol, C++ & Erwin; Develop & implement client/ server applications in oracle financials using synchronization techniques such as PL/SQL, Developer 2000 & Designer 2000; Perform system & integration testing. Bachelors req'd in Computers, Engineering, math or any related field of study +2 yrs of related exp. 40 hrs/wk. Must have legal authority to work permanently in the U.S. Send resume to HR Manager, Compro Consulting Group,Inc., 8619 W 95th St., Hickory Hills, IL 60457.

Sales Engineers needed. Seeking qual. cand. possessing MS/BS or equiv. and/or relevant work exp. Duties include: analyze product value propositions, demonstrate products and create solutions for clients. 2 yrs. marketing experience required. Must be willing to travel and relocate. Mail resume & ref. to: Zycus, Inc., 3375 Scott Blvd., Santa Clara, CA 95054, ATTN: HR

The Whitaker Companies has an opening in the Houston Metro area for a Senior SAP/Technical Consultant: Provide Techno-functional solutions in SAP. Develop prototype solutions. Perform Functional Configuration, programming in ABAP/4, Testing, Transportation to Production utilizing Insite or Revtrac software in various Asset Management, Human Resources, Time Management and Cross-functional by utilizing related software, Peregrine, MS-Office. Bachelors degree in Business, Information Systems or related field plus 3 years in job offered or 3 years as Programmer/System Analyst involved in developing Prototypes, customizing FI and Interfaces, Reports in ABAP/4 and related duties. Send resume to: Whitaker Consulting 1200 Enclave Parkway Suite 200 Houston TX 77077. www.whitakerconsulting.com, paul.choudhuri@whitakerconsulting.com

SOFTWARE ENGINEER to design, develop, maintain and support web-based application software in a client/server environment using C++, J2EE, BEA Weblogic Application Server, OOAD, SSAD, OOPS, Rational Rose, Perl, JavaScript, Oracle and DB2 on UNIX, SUN Solaris and Windows platforms. Require: M.S. degree in Computer Science, an Engineering discipline, or a closely related field with two years of experience in the job offered. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Ravi Kandimalla, President, Everest Computers Inc., 900 Old Roswell Lakes Parkway, Suite 300, Roswell, GA 30076; Attn: Job VP.

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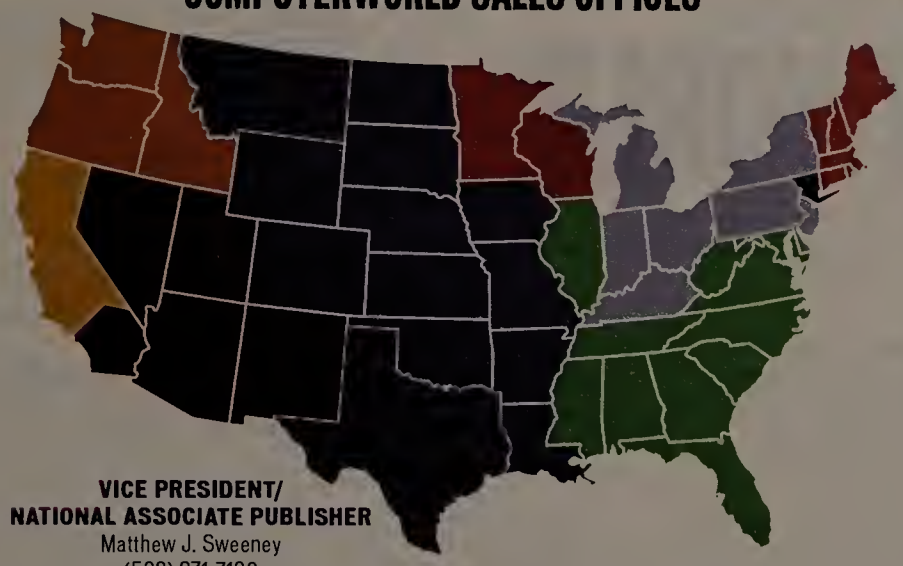

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Health Net

nology that will be used to support the network.

The eHealth network will capture patient data collected by hospitals — especially in emergency rooms — and automatically distribute information to health agencies. The project was in the works prior to the recent outbreak of SARS, or severe acute respiratory syndrome, and the network isn't being developed specifically to gather SARS-related data.

But Dr. Russell Ricci, general manager of IBM's global health care division, said automated syndromic surveillance technology that can collect information about symptoms like the high fever and respiratory problems that are common with SARS will be a key component of the three-month test.

In addition to emergency room data, syndromic surveillance systems can gather information about sales of over-the-counter medicines, Ricci said. However, that capability won't be part of the network test, he added.

The pilot project will demonstrate how to apply sophisticated data mining techniques to the health care industry and how to tie together stovepiped hospital information systems using commercial middleware tools, Ricci said.

The test version of the network will support electronic data exchange standards that were mandated by the Department of Health and Human Services in March, Marchibroda said. She added that eHealth officials hope that the pilot project will lead to the development of a full network, but that will depend on additional funding. EHealth is building the test network in a partnership with the New York-based Markle Foundation.

> **"Maybe eHealth can . . . demonstrate that it is possible [to build such a network].**
>
> **DR. SETH FOLDY,** HEALTH COMMISSIONER, CITY OF MILWAUKEE

Ricci said he couldn't quantify the cost of implementing a full nationwide network. "I would not even know where to put the decimal point," he said, adding that federal backing would likely be needed.

Dr. Seth Foldy, health commissioner for the city of Milwaukee, said he hopes that eHealth's efforts will lead to the eventual development of a system that would make it easier to exchange syndromic surveillance data. "This is not going to be easy, but maybe eHealth can build a business case and demonstrate that it is possible," Foldy said.

He noted that the surveillance data can alert doctors and public health officials to potential outbreaks of epidemics like SARS more quickly than is possible with traditional, diagnosis-based systems, which often require lab tests that take days to complete. Syndromic systems provide more immediate information about patterns of symptoms among patients, Foldy said.

Software Helps City Officials Track Outbreaks

Milwaukee's municipal government uses an emergency room management application that includes a Web-based syndromic surveillance system for spotting potential epidemics, said Dr. Seth Foldy, the city's health commissioner.

The emergency room application was developed by the Frontlines of Medicine Project, a nationwide collaboration among doctors and medical IT specialists that is marketed by Infinity HealthCare Inc.'s EMSystem division. Both the Frontlines project and EMSystem are based in Mequon, Wis.

Foldy said the Frontlines group added a SARS surveillance tool earlier this month. The SARS component consists of a Web-based form that emergency room personnel can download to record and track any SARS-type symptoms patients are experiencing as well as any recent trips the patients have taken to China or other countries where SARS outbreaks have been documented.

If a patient shows signs of the disease and has recently visited a known SARS zone, hospital workers are instructed to call Milwaukee's health department immediately. Otherwise, hospitals upload symptom data to local health officials at the end of each day.

Foldy said he would like to see the data transfer automated in order to free hospital clinicians from the need to fill out forms.

– Bob Brewin

Continued from page 1

Strike Threat

the deal with HP was announced, the IBOA served Bank of Ireland with two weeks' notice of possible "industrial action," which includes the threat of an all-out strike. That followed a vote in which 83% of the union members who took part sided with the plan to send the notice to the bank, according to a posting on the IBOA's Web site.

Calls to IBOA general secretary Larry Broderick weren't returned by press time, and it wasn't clear how many bank employees actually participated in the vote. But on the union's Web site, Broderick is quoted as saying that the vote "testifies to the huge concern and uncertainty" about the proposed outsourcing deal among IT staffers at Bank of Ireland.

The IBOA's top priority is to prevent the bank from proceeding with the outsourcing arrangement until there are "full negotiations and agreement" with the union, Broderick said. Otherwise, IT workers at the bank "will not be cooperating with any proposal to outsource," he warned.

Anne Mathews, a spokeswoman for Bank of Ireland, said bank officials "couldn't have meaningful discussions" with the IBOA until a preferred outsourcing vendor had been chosen. Mathews added that the contract negotiations with HP are expected to take four to six months to complete. The union will have a voice in those discussions, she said, declining to comment about what transpired during last week's talks with the IBOA.

HOW TO

Communicating Outsourcing Plans To IT Workers

- **Be as open as possible about the plans.** The more secrecy there is, the more negative the employee reaction will be.
- **Make sure middle and lower-level managers are equipped** to handle the questions IT staffers are likely to have.
- **Develop programs,** such as those for training workers in new IT skills, that can help to mitigate the threat of employee backlash.

SOURCE: GARTNER INC., STAMFORD, CONN.

Growing Unrest

In an April 18 research note about the strike threat, Gartner Inc. analyst Diane Morello wrote that she expects to see more actions by IT workers to protest "what they perceive as unsettled employment situations" as a result of job cuts and an increase in the amount of IT work being outsourced, sent offshore or farmed out to contract and temporary workers.

Morello said IT managers need to anticipate potential worker backlash against outsourcing deals, even if their IT departments aren't unionized. Companies that don't do so risk work slowdowns or other productivity drags, she said. "The important thing is to communicate honestly and respect your employees," Morello added (see box).

That's precisely what DaimlerChrysler AG executives did before the automaker last year began outsourcing maintenance of about 150 applications that support its engineering, sales and manufacturing operations to offshore services firms Infosys Technologies Ltd. and Syntel Inc., both based in India.

DaimlerChrysler held a series of "town hall" and breakfast meetings at its facility in Auburn Hills, Mich., in an effort to do "whatever it took to answer questions and concerns" about the outsourcing plan, said CIO Sue Unger.

Unger said the meetings helped her and other IT managers convey to the 100 internal staffers and on-site contractors who had maintained the applications being outsourced that they would be redeployed to work on more strategic efforts, such as Web services and portal software projects.

The outsourcing program has been "very successful," Unger said, adding that it has helped DaimlerChrysler cut its IT costs and provided the affected workers "with a brand-new career."

MORE THIS ISSUE

For coverage of how offshore outsourcing is affecting U.S. workers, turn to page 39.

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FRANK HAYES ■ FRANKLY SPEAKING

As Bad as It Gets

TIMES ARE TOUGH. Budgets are tight. Patience is short. We're faced with underfunded projects, understaffed operations and underappreciated challenges. The goal of getting IT right — making sure our technology works, and works for the benefit of the business — has never been tougher to accomplish.

Fortunately, one thing is still easy: screwing up.

What? You've forgotten how? Never fear! Just commit this list of a baker's dozen tips to memory — or clip it out and keep it handy — and you'll never be short of bad ideas again:

Assume. Assume you know what users need. Assume you know what managers expect. Assume you'll have no problems. Assume you'll catch up when the schedule slides. Assume no problems will show up in testing. Assume no one will mind all your assumptions. Why should they?

Expect. Expect support from management. Expect perfection from vendors. Expect clear specifications from users. Expect flawless execution from the IT staff. Hey, it could happen — so why not expect it?

Overpromise. Paint an improbably beautiful picture of glitch-free hardware, bug-free software and friction-free networks. Set an early delivery date. Make the list of features long. Keep expectations high. What else will spur you to do your best work?

Complicate. Avoid straightforward designs. Sneer at simple solutions. Encourage complexity. Who's going to respect technology that anyone can understand?

Alienate. Alienate the users who can explain to you what your systems need to do for them. Alienate the business managers whose budgets you'll spend. Alienate senior management, from whom all funding flows. What do you need anyone's cooperation for anyway?

Experiment. Users make the best guinea pigs. Production systems make the best testbeds. Untried technology offers its greatest rewards in mission-critical applications. When your original plans don't work out and the deadline gets near, why not give something completely untested a shot?

Deny. Deny responsibility. Deny promises you made. Deny failure. Deny the limits of your staff, your systems and your own abilities. Deny what's obvious to everyone else. Who should they believe — you, or their own lying eyes?

Change. Variety is the spice of life, and everyone loves something new. Change what users see on their screens. Change their passwords. Change what gets blocked by your filtering software. Change your help desk hours. Change your procedures. Change the rules. What's wrong with these fuddy-duddies — can't they get out of their rut?

Procrastinate. Delay that status meeting. Push back that code review. Put off those patches and upgrades and audits. Isn't there always time to get things done at the last minute — and if there isn't, can't you just push back that last minute one more time?

Withhold. Withhold information. Withhold cooperation. Withhold anything that would give users, business-side managers or executives a better sense of what to expect, when to expect it and how useful it will be if it ever arrives. Who ever heard of winning at poker without keeping your cards close to your chest?

Underestimate. Make low-ball guesses for cost. Predict a minimum of problems. Sketch out short development schedules. Everybody loves an optimist, so why plan for expenses and delays that might never materialize?

Avenge. Take revenge for perceived slights and possible acts of sabotage. Return real attacks and imagined affronts in kind. Pay back every case of stupidity, folly and ignorance, measure for measure. Why risk letting someone get away with it?

Ignore. Ignore problems, warning signs, complaints and objections. Ignore suggestions, feedback and test results. Ignore the recommendations of management and users. Ignore rumors and rumblings of discontent. Why sweat that small stuff? After all, you've got IT work to screw up. ◗

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SHARK TANK

Don't Say Anything

For months, IT pilot fish for a school district begs this clerk for the data to file the state-mandated school bus accident report. Her constant reply: "No rush – the state can wait." Finally, as fish faces a big hardware rollout, he warns, "If we don't do it soon, I don't know when I'll have time to send it." So when district gets in trouble for failing to file the reports, what does clerk tell her boss? "He said he doesn't know when he'll have time to send them."

Don't Help

Friday afternoon: IT administrator personally frees up some space on a server to install new software. Monday morning: "Company's accounting software is spitting out errors right and left, and all users who have rebooted their computers can no longer access the server," says a support pilot fish. "Turns out he uninstalled all the licensing administration tools and deleted some critical accounting software files, which caused the backup process to fail. The accounting department had to rekey over 2,000 transactions."

Don't Resuscitate

This hospital's aging, outdated database server is finally replaced – but users demand that the old server be kept running too. "They say they're still using the old server daily," says pilot fish. But after several months, the IT shop doesn't buy it. "We unhook the network connection from the back, leaving it stuck in enough to look like it's connected," fish says. "That was months ago. Guess who hasn't said anything about it yet?"

Don't Touch

This pilot fish's workstation needs to run continuously for a few weeks. It's on a UPS, but to make sure it remains untouched during a scheduled weekend power outage, he leaves a note: "Please do not turn off under any circumstances unless you speak with us first." On Monday, the machine has been rebooted. "I saw the sign and made sure I did not turn it off," office manager says. Sighs fish: "She crawled under the desk and unplugged it instead."

Don't Slam The Door

Circa 1980, this New York bank's PDP-11/40 minicomputer gets moved across town. "The techs put this pretty large system – about the size of a VW minibus – back together in record time, a couple of days," pilot fish says. "They finished their diagnostic, closed one remaining cabinet door – and sliced through a misrouted cable, which shorted and burned out almost every system in the PDP-11. It took two weeks to repair all the damage."

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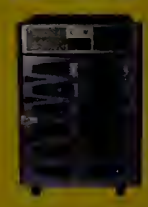

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*Source: IDC's Worldwide Quarterly Server Tracker, February 2003. Based on revenue and shipment growth, CY2002, all OSs.

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